CHAMBERS'S Journal

OCTOBER
1950

GOLD ON THE YODDA
A Papuan Story by R. WILKES HUNTER

I RAN AWAY TO SEA
By RIMO

THE DEVIL AND DR FIAN
By LEWIS SPENCE

THREE WARNINGS
An Irish Story by THOMAS KELLY

EXPLORER'S TREE
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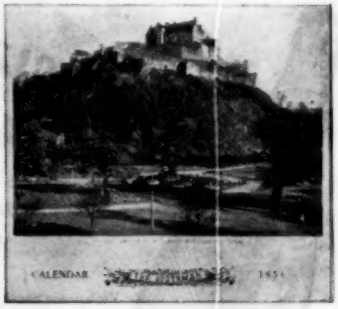

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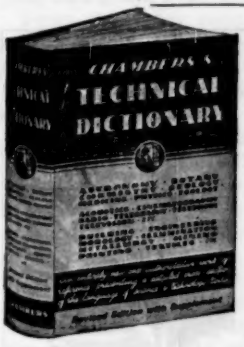

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Gold on the Yodda

R. WILKES HUNTER

THROUGH sago swamps and tangled jungle Graham and his carriers hacked their way towards the distant mountains, blue and mysterious on the horizon. Wearily they toiled over fallen trees, overgrown with masses of brilliantly-flowering creepers, knotted and interwined, where a hurricane had cut a neat swathe through the jungle. Death lurked for the unwary along the native pads, where spear-pits had been cunningly masked with vines and matted grass. The spears, fixed firmly in the ground, point upwards, were poisoned by being thrust into the putrid remains of man, or pig, or dog. Whoever fell into a native spear-pit died terribly—so they avoided the native pads.

Where the jungle thinned, their track led through twisted kunai-grass, stiff and needle-sharp; past villages of native houses, inside strong stockades, perched high on razor-backed ridges. For days they had seen no women in the villages—only men who stared at them sullen-eyed, and followed at a distance. And ever and always, native pads . . . spear-pits. . . .

Graham was proud of his team of boys and the way they carried. They were Mambare River boys, wild as hawks, each bearing his fifty-pound mat of rice, or stores, or mining equipment. Those stores and equipment represented a fortune to Graham—or he meant to make it so. For there was gold on the Yodda, and in his supplies and equipment he had invested every penny he possessed. True, there would be difficulties, but difficulties were made to be overcome. Graham sighed, squinting his eyes against the glaring sunlight, and looked towards the mountains.

AHEAD, beyond a valley of wild sugar-cane, he could see a large village. He glanced back along the carriers, winding up the trail, to Mukua, his boss boy, at the rear of the straggling line. Mukua was a tall, lean Motuan, rifle slung over his shoulder, a scarlet flower stuck in his mop of woolly hair. In front, the track went down through the cane, but sugar-cane sometimes burns like tinder—it could be a bad place to be caught in by hostile natives. Graham waved to Mukua, pointing left into the jungle. The party swung left, away from the cane.

From the valley came a sudden, angry roar of sound, the hooting and howling of conch-shells and wooden war-horns, the yelp of high-pitched yodelling voices. A spear whistled out of the cane . . . another. Unslinging his rifle, Graham saw a native in a feathered headdress leap from the cane, spear poised. Mukua fired; the native fell forward, to bound upright again, his plumes dishevelled, and spring with a shout of fear back into the cane.

Graham fired a shot into the cane at random, and stood, rifle at the ready, waiting. The war-horns and conch-shells still hooted, the natives yelled and yodelled. There was movement stirring the cane; the village stockade bristled with plumes and spears, and beyond, Graham could see more villagers running along the ridge ahead of his party. The carriers huddled together chattering. They were coastal natives and in deadly fear of the fierce, head-hunting mountain tribesmen. Mukua alone was unafraid. He waved an arm jauntily at Graham and with kicks and threats drove the carriers on. The hostile villagers followed them all day, but did not again attack.

Through the night Graham and Mukua kept watch by turn. The war-horns and conch-shells wailed again at dawn; and through the long day they glimpsed tossing plumes and spears and heard the fierce yodelling of fighting-men. As they made camp at sunset the villagers were silent. A camp boy getting wood for the fire strayed beyond the watching riflemen. They heard the thump of clubs on flesh—a scream. The boy did not return.

On the third day they entered the territory of a different tribe. There was a higher, fiercer note in the yodelling cries. From the jungle beside the trail a native leaped silently amongst the carriers. He drove a short stabbing-spear into the back of one of them; the victim threw up his arms, screamed, and fell. The villager yelled in triumph, jerked a stone axe from his girdle, and rushed at Mukua. Mukua shot him dead at close range. Graham fired twice into the jungle beside the pad. Something yelped and floundered there. They moved on.

They camped on the third night by a swift-flowing river. The carriers were sullen and frightened. They glared at Mukua and murmured amongst themselves. Graham they avoided. Graham doubled the guard and took the first watch. Towards the dawn he was awakened by a fumbling hand. He jumped up, reaching for his rifle, to find Mukua beside him, blood from a head-wound trickling down his face. The carriers had clubbed him from behind, and were gone, with a rush like startled cattle, leaving him unconscious, preferring to face the demons of night rather than go deeper into the hostile mountain country. The supplies and equipment lay scattered round the dying embers of the fire. Graham dressed Mukua's head. They broke camp before the dawn, and, carrying what they could, stepped silently into the jungle.

A FAINT, unhealthy mist hovered over the pandanus swamp. There were many mosquitoes. Graham laboured on, his feet slipping on the greasy pandanus roots, unseen beneath the mud. His hands were torn and festering from grasping the thorny limbs and trunks to drag himself along. Slipping, stumbling, forcing himself onward towards that goal which to him now had lost the promise of riches, and meant only security from exhaustion and sickness—the fabulous and as yet almost unknown Yodda River goldfields.

They had seen no more hostile natives. The country here seemed uninhabited; doubtless the war-parties were following the fleeing carriers. Few, if any of them, would ever reach their native village. They would be killed, perhaps eaten, and their heads would be the proud boast of some mountain-village fighting-men.

By noon the swamp ended at the edge of a creek. Its clay-discoloured waters slid around smooth granite boulders washed down from the ranges. Across the creek, wild sugar-cane fully twelve feet high, thick as wheat in a field, formed an impenetrable barrier. Graham leaned against a pandanus and wiped the sweat from his eyes. A muffled drum seemed beating in his temples. Thump, thump, thump! Regular as a heart-beat. He felt suddenly cold, and shivered. They were lost within sight of the mountains which cradled the Yodda River. He found himself not greatly caring. There was a limit to human endurance.

The stream rolled past silently between its greasy banks. It was the colour of the coffee they used to serve in Pitt Street cafés, before he married Jean. . . . Jean and the boy! For them he had kept on, even though the stores that meant so much lay looted and rotting back there on the trail. There was gold on the Yodda. He knew that. A fortune to the man with guts enough to work and fight for it—but now it was not for him.

Mukua, lithe as a cat, was working his way along the creek. Presently he leaned forward tensely, shouting: 'Taubada! There!' Graham stumbled to his feet and joined the native. A path clean cut through the cane led straight as a taut string towards the range.

So they came at dusk to the Yodda.

COOKING-FIRES and voices of natives. The chanting of carrier-boys. A voice bawling from the Warden's native-built house for the boys to 'shut that row down there!' Lights gleamed in a larger house that served as a community meeting-place for the miners. Graham could hear the clink of glasses, the slither of shuffled cards. Wearily he dropped his rifle and pack against the wall. Mukua put down his load, sighed, and

squatted on his heels, his eyes turning longingly towards the cooking-fires.

Graham hesitated. Voices came out to him, and deep laughter. 'There was a mari over at Misima, a pointed-breasted girl, with eyes like velvet.' 'Those —— Germans chased me out. I had a fortune in plumes.' 'She panned fourteen ounces to the ton!'

The buzz of voices stopped as Graham entered. It seemed a long way to the rough bench that served as a bar. His knees felt weak. Sweat, cold as ice, was trickling down his face into his beard. He undid his belt and shook ten sovereigns on to the bench. 'Boys,' he said, 'I'm Bob Graham, lost all I had coming up. Drinks are on me. Tomorrow I'm looking for a job!'

'Glad to meet you, Graham. Sure we'll drink with you—and as for the job, why—'

The man who had spoken grunted and lunged forward to break Graham's fall, as his knees bent and he slid to the floor. The man in charge of the bar hawked and spat, and placed the ten sovereigns on a shelf between two bottles. 'Put him in my shack,' he said, 'and have one on the house instead. Someone had better see to that boy.' He jerked his head towards where an anxious Mukua peeped in at the door.

So they sent Mukua to the carrier camp and put Graham to bed, liberally dosed with quinine. Graham knew very little about it—nor indeed about anything at all for the next few days. His first clear vision was of Mukua, standing just inside the door watching him with uneasy eyes. At sight of him he mumbled: 'I'm alright!' and went to sleep. After that came a period of terrible fatigue, of lassitude and heavy sleep.

Then one day he had a visitor, a burly, bearded miner, with one hand missing from the wrist—Jimmy Cuffe. On the Fly delta Jimmy had lost the hand to a crocodile, but had evened the score with a dead pig loaded with several sticks of dynamite. He came to the point briefly. 'I've pegged another claim on a terrace high up the river. I'll supply tools, stores, a sluice-box, and boys. You bring that boss boy of yours and work it. We split fifty-fifty over expenses.'

He turned away from Graham and spat with force and accuracy out of the door. 'We square up in six months, when the wet starts. Then, if you've got sense, you'll go back South to that wife and kid you've been raving about. If not,' he added carelessly, 'you'll have enough gold to buy stores and start on your own. And we'll probably plant you out there under the casuarina tree. You seem to get your fever pretty bad, son.'

Graham stammered his thanks, and the miner, growling an embarrassed curse, left. Mukua stirred uneasily by the door: 'We work soon, Taubada?'

Graham lay staring up at the palm-thatched roof: 'Yes. We work soon, Mukua, for six months, and then . . .'

THE south-east trade-wind was faint and refreshing. Graham loved to sit on the log above the claim at evening. He would close his eyes and keep very still, feeling the sweat on his forehead turn cool, then cold, as the sun dipped behind the Owen Stanleys.

He was making money. This claim was a particularly good one, and Jean and the boy were benefiting by it. He had sent her money and the canvas bag of gold he kept beneath the bunk in his hut was growing heavier week by week. Soon, he thought wistfully, he would be going South, to be with Jean again . . . and the boy. Six months perhaps. Yes, six months—just another six months, and he would go South.

In the two years he had been on the Yodda he had witnessed many changes. He had watched the little cemetery by the casuarina tree grow. Jimmy Cuffe lay there now, and nine others. He had seen a roughly-made track come creeping up from Buna. Later, another surveyed track from Oro Bay. Stores arrived more freely now, although there were still hostile, head-hunting natives along the trails. A store had opened down on the Kumusi as a base to supply the Yodda field. The Yodda had changed, outwardly at least; the camp had grown.

He drew up his knees and rested his folded arms upon them. The sky was clear, the sun just dipping behind the range. He pillowed his head upon his arms and closed his eyes. Yes, he would go home in six months. November at the latest.

He was dozing when Mukua came to call him to the evening meal. The native stood for a moment looking at him, wondering vaguely at the change in the white man. The eyes were sunken in dark shadow, the cheek-bones protruded. Graham's arms were thin and his shirt seemed to hang on him. His

skin was yellowish and beaded with sweat. 'Taubada too long he stop,' the boy murmured as he stepped closer to waken Graham. Mukua was a Motuan, with all the Motu superstitious dread of the dark and the demons of night. The Taubada must be roused very gently. When a man slept his spirit was out of him, drifting, far away, in a dream-world of good, or evil. One must give the spirit time to return before the body wakened. So Mukua touched Graham softly with his finger-tips and paused before murmuring: 'Kai, Kai, Taubada!' Graham stirred, and rose to follow Mukua back to the camp.

The days slipped past in monotonous repetition. He would examine the gold by the light of the oil-lamp in his hut, lovingly rolling the small nuggets about with his finger-tips. How smooth the water-worn gold! Virgin gold, ageless as the mountains—yet the symbol of power and security. Best of all, he loved the heavy drag of it in the bottom of the dish, when he cleaned the sluice-boxes. Wet gold to him was beautiful. When he ran the water off it, it gleamed in the bottom of the dish, like tropic stars against a background of velvet night.

November came and passed, and with it the south-east trade-wind faltered and died. At Christmas he wrote to Jean: 'I had intended coming home for Christmas, but I have two claims now in full production, and am looking over some likely country higher up. I'm taking good gold from the claims. I'm going to bring it with me when I come. We'll never want again.

'I will wait till the end of the wet season. When the trade-wind comes again I will be coming South. And oh, my darling, it's been so long, so very long! How I've missed you—you and Boy.'

THE monsoon came in with a roaring thunderstorm that crashed and echoed from the razor-backed ranges; purple lightning, and lightning that seemed almost violet, flickered continuously over the boulders in the creek. Electricity in the woolly hair of the boys formed a glowing iridescence, like halos. They howled and fled to the huts.

Then came the rain. Rain that dripped, and ran in little rivulets from every tree and scrub and boulder. Rain that cascaded into the Yodda and the myriad little watercourses that swelled the river of gold. Graham saved one sluice-box, but two more went down-river. Perhaps down to the far-off Mambare, up which he and Mukua had toiled so long ago. Almost three years ago now. In Papua, so very long ago.

The rain kept on, sometimes in torrential drumfire bursts that sagged the thatched roof with weight of water; sometimes in steady pattering rain; sometimes in mountain mists so heavy with moisture that they wet Graham to the skin in a matter of minutes. He went down with dysentery, and a bad attack of fever. When he recovered he lay one night with the light out, listening to the steady drip of rain from the eaves and the noisy brawling of the river. The tamarind tree by the door dripped water dismally.

When the trade-winds blew he used to listen to the merry clattering of the black seed-pods, and admire the lacelike tracery of leaves against the stars. Graham sighed. He would go when the wet season ended—and he would never come back to Papua.

From his door he could see the sheltered cooking-fire, and the figures of boys squatting by the embers. The tall figure of Mukua stood etched against the glow. Mukua was arguing with one of the boys, gesturing with slow sweep of hands from the claim to the hut where Graham lay. The raised voices came to Graham, softly subdued by the rain.

There was bad blood between two of the boys—something about a mari, Mukua had said. He made a mental resolve to straighten the matter out in the morning. Graham closed his eyes to shut out the glare of the fire and the figures of the arguing boys. He opened them again to a sudden urgent rise in crescendo of the voices—a hoarse yell! Outlined against the fire a whirling struggle had commenced. One of the boys had a club. He slashed at Mukua's knees with it. Mukua leaped high, crashing into the other, and in an instant had torn the club from him and stepped back, the weapon swinging aloft. Behind Mukua a dark shape sprang forth, an axe gleamed in the firelight—and Mukua fell forward into the fire.

At the sodden thump of the blow Graham shouted and scrambled out of bed towards the rifle that stood, oiled and loaded, in the corner. Feet pounded on the path, eyes gleamed from a shadow at the door: 'This from me, white man!' hissed a voice in Motuan. Something whirred through the darkness and struck the bunk. Graham

fired and heard the quick slap of bare feet on wet ground as the native jumped aside.

When Graham staggered outside, rifle ready, there was only blackness and dripping rain. Fungus glowed phosphorescently everywhere in the wet scrub behind the hut. The native was gone. From the camp came the slow keening of grief. Mukua lay half in the fire—dead!

Two boys were missing. The law was at Cape Nelson, a hundred miles away as the crow flies, but by native trails—perhaps three hundred miles. Graham would have shot the murderers on sight, but he knew that by the morning they would be gone, lost in the maze of jungle and river and mountain. His chance of ever seeing them again was remote.

They buried Mukua just outside the little cemetery near the casuarina. The other boys carried his few treasured possessions, and laid them beside him, for a man must go prepared to the land of spirits. And to the native mind the things a man treasures in life are those he will need after death, for a man's desires never change. Graham had learned much from Mukua, so now he brought the rifle the boy had used so well on the trail up from the coast, and laid it gently beside him. When he straightened, he felt better for the quixotic action, even though rifles were hard to come by on the Yodda.

Mukua's epitaph was brief. Graham, who patted the earth down upon him, said: 'Sleep well, my friend!' and turned away.

GRAHAM ran another sluice-box, and there was much of the work that he must do personally, his new boss boy lacking the experience of Mukua. In March came fine weather, a freak of the monsoon. For ten days the sun shone, and the air was cool and clear like an English spring. Graham took one hundred and forty ounces from his claims in ten days.

Then came the rain again. Recurrent dysentery racked Graham, fever seemed to be on him incessantly. In April he knew that he could work no longer, and, leaving the boss boy in charge, he struggled down to the main camp. 'I'm sick, damned sick!' he told the Warden, holding to the door to keep himself upright. 'I'm going down to the Kumusi with the next trip out. I'm goin' South. I'm . . . so . . . very . . . sick.'

The Warden was worried. He put Graham to bed, and sent for an old-timer from down the creek. They had a look at Graham. The miner lifted the lids from the closed eyes, and shook his head. The Warden produced a bottle and glasses. 'Luck!'

'An' to you.'

'Hah,' they sighed and relaxed, looking down at Graham.

'I'm afraid the —— is goin' to die on me,' said the Warden aggrievedly. 'But what do you think?'

The old-timer grunted. 'Blackwater fever,' then added laconically: 'Graham's not going any place.'

Graham died early in May, when the first of the south-east trade-winds brought fine weather and the smell of the sea like the peace of a benediction to the Yodda. The death of a miner was always an excuse for a holiday, and at the planting of Bob Graham the whisky flowed freely. The Warden had neither Bible nor Prayer Book, but whisky was an excellent aid to improvisation. 'Bob Graham was a white man,' he said, glancing around self-consciously. 'Even his boys liked Bob Graham.'

Graham's boss boy grinned, only half-understanding the words, but feeling that something was expected of him, so he interposed timidly: 'Taubada too long 'e stop.'

The Warden coughed. 'The Bible says something about ashes to ashes, and dust to dust,' he went on. 'Graham needed money because he had a wife and kid in Sydney. That's why he stayed. He took gold out of the Yodda, out of the earth of the Yodda banks. The Yodda meant more to Graham than to most of us. But, like the boy says, he stayed too long, and we're planting him here beside the Yodda.'

He paused, staring at the handful of earth which he had picked up from the pile beside the open grave, letting the soil run crumbling between his fingers. 'Get on with it, Bill,' a miner suggested. 'I'm almighty dry!'

The Warden didn't hear him. He was staring at the earth remaining on the palm of his hand. Yellow specks gleamed wetly amongst the dirt. 'Gold!' he cried, amazed. 'Gold—here in the cemetery!' The miners crowded around him. There was a roar of voices as they recognised the richness of the find, and a concerted rush to peg claims. They washed that cemetery to the last bone and the last ounce.

Graham's boys laid him quietly on the

terrace above his claim, beneath the tamarind where black seed-pods clattered in the trade-wind, and the leaves showed in a lacy network against the stars. And, as is the native custom, they buried him with the things he treasured most in life: his loaded rifle, the battered prospecting-dish—and the heavy canvas sack of gold they found in his hut.

Westminster's Minor Wonder

The Heating and Ventilation of the New House of Commons

GEORGE FYFE

WITH the opening of the new House of Commons this month history will repeat itself rather curiously. A hundred years ago, in the same month of October, M.P.s of 1850 were also taking their seats for the first time in a new House of Commons, which, as to-day, had had to be built because of the destruction of the old.

The circumstances, however, were very different. Peel, Cobden, Gladstone, Bright, and all the other parliamentarians who were present that day, found themselves in a chamber that was not finished. The walls were bare of decoration, the stained-glass windows were not fitted, and the benches consisted only of deal boards that had been covered with baize.

The purpose of the assembly was to test the acoustic properties of the new House, and as the ordinary business proceeded Sir Robert Peel roved about, listening at various points long enough to enable him to assess the hearing qualities. The general opinion was that they were not very good, and after the sitting had lasted for three hours it was abruptly adjourned. The Speaker led the Members back to the temporary meeting-place that had been in use since the fire of 1834.

This was probably the only occasion on which the House of Commons has met to conduct its business in two different chambers on the same day. It was not until 1852 that the new House was ready for opening by Queen Victoria. Even then, a great deal remained to be done at the Palace of Westminster, and a few more years had to elapse before the whole ambitious scheme had been completed.

THE disastrous fire of 1834 came at a time when public interest in Parliament was pronounced, for the Reform Bill had just been passed, and other great causes were being furthered by men whose names have passed into history. A few months earlier Gladstone had taken his seat for the first time, while in the background a young man named Erskine May was beginning work in the library that was to end in his becoming Parliament's still unchallenged authority on procedure. Disraeli was not to make his unsuccessful maiden speech until 1837, but Rowland Hill was already preparing to introduce the world to the first adhesive postage-stamp. Sir Walter Scott had died in 1832, and within the following eight years Dickens wrote *Pickwick Papers*, *Oliver Twist*, and *Nicholas Nickleby*.

To the parliamentarians of those days the destruction of their ancient meeting-place, with its agelong record of exciting happenings, must have seemed an irreparable loss. If,

however, it had to be burnt to the ground, it was perhaps appropriate that it should be not from any prosaic cause but through the medium of so ancient a device as the tally-stick.

This was the token that had long been employed for the purpose of Exchequer payments. Usually a slenderly-fashioned piece of well-seasoned willow or hazel, it was carefully notched, the width of the various incisions representing the amount of the payment. It was the duty of the Deputy Chamberlain to split the stick with a knife and mallet and to retain one of the halves. The system was a cumbersome one, and when, in the early part of the 19th century, it was finally abolished for government transactions, it became necessary to dispose of the vast accumulation of cloven rods that had been officially stored.

It was decided that a fitting method was to burn them in the furnace heating the Houses of Parliament. Unfortunately a stoker was careless. Before going off duty for the night he stacked the fire so heavily with tally-sticks that the blaze which occurred could not be checked until practically the whole of the Parliament buildings were destroyed.

Just as was to happen in 1940, the fire-fighters could not pump any water from the Thames, because the river was at low-tide. The danger was that the flames might spread across the roadway to Westminster Abbey, and the Keeper of the Chapter House became alarmed for the safety of the precious records deposited there. When he sought urgently to remove them, the Dean counselled caution. He pointed out that they could not be taken away until permission had been obtained from the Lord Commissioners of the Treasury, who were not easily available. Fortunately the fire did not extend.

WHEN the question of rebuilding the House came to be considered, many people favoured a change from the Westminster site. One suggestion was that Green Park should be chosen; another that Buckingham Palace, which had just been reconditioned, should be taken over. King William IV had no objection to the latter proposition, for he detested the Palace and had refused to live in it. The Duke of Wellington, however, felt strongly that it would be a mistake to abandon the old site. The Houses of Parliament, he insisted, must be so situated that they could not be surrounded at any time by a mob, and because of this the Thames boundary was important. In the end, the old site was retained, and Charles Barry was selected as the architect for the new buildings.

His original estimate was that the work would be completed in six years and would cost £724,000. Actually, it took more than twenty years and cost £2,200,000. Barry's chief assistant was Augustus Pugin, who had played a considerable part in the English Gothic revival, but a dispute which subsequently arose between the two over their respective shares in the design was of small moment in comparison with a fierce controversy over the design itself. The situation was worsened by the mismanagement of the building operation. Because no central authority was in control, there was a lack of co-operation that led to long delays. Only after many years of bickering, and when the work was approaching completion, was this oversight remedied.

Barry, notwithstanding all the hindrances, did some brilliant work, particularly in constructing the House of Commons on foundations that were ten feet below the high-water level of the Thames. The five-foot raft of lime-concrete he put in is still in such excellent condition that it has been retained as the foundation for the new chamber. In addition, it was characteristic of Barry's enterprise and ingenuity that he was not afraid to resort to the use of cast-iron, then a novelty, for trusses and as a roof-covering in the form of large slabs.

THE old House had one great defect—its heating and ventilation arrangements. A very large amount of money was spent in providing an installation of an elaborate kind. Merely for the accommodation of the apparatus, the whole of the space below the floor of the House had to be excavated to a depth of twenty-seven feet. From the very outset, however, the results were unsatisfactory, and in the generations that followed, one Select Committee after another was appointed in the hope that things could be put right. In spite of all the modifications that were made on the advice of experts, there was little improvement, the main complaint of M.P.s being that they could not keep their feet warm.

Perhaps too much significance can be attached to so human a failing as cold feet,

but, if it is constantly to afflict our legislators in the mass, all sorts of possibilities seem to arise. In view of the effect that physical discomfort may have on mental processes, who can measure the extent to which that defective heating-system influenced the course of legislation in the old House?

In a determination to avoid a repetition of former troubles an exceptional amount of care has been devoted to the heating and ventilation of the new House of Commons. The object has been to produce a system that will be as near perfection as humanly possible, and the result promises to be one of the minor wonders of Westminster. Dr Oscar Faber, the distinguished engineer who is responsible for tackling this problem of heating and ventilation which for more than a hundred years evaded solution, in spite of the galaxy of talent directed to it, has amusingly confessed that he does not know whether his own effort was inspired by courage or foolhardiness.

THE requirements have certainly been exacting, for the problem of maintaining in all parts of the House, and in any conditions, a temperature of roughly 67° F. and a humidity of between 50° and 60° is much more complicated than in any ordinary building. Apart from the changes that occur in the outside air, which may vary during the year from a temperature of 25° to one of 85°, great changes take place in the House itself. There are, for instance, occasions on which, because of some statement or debate of moment, the chamber may hold nearly a thousand people. Each of them is producing through his own bodily heating-system approximately 500 B.Th.U. per hour in the form of sensible heat, latent heat, or moisture. This has to be taken seriously into account in a mechanical regulation of the desired temperature, because quite suddenly the important event of the day is over and the population falls. Perhaps only a handful of Members are left. A similar situation occurs in the division lobbies. From being empty, they become crowded. Nor is this all. When only a few Members are in the House, it may easily be that other parts of the chamber, such as the Press Gallery, are full. The temperature needs of various places are not the same and in the interests of efficiency must be treated accordingly.

The main method of heating and ventilation in the old conditions was by gratings in the floor of the House, through which the warmed or cooled air was sent up from the basement. The new method is on an entirely different principle. The two supplies of air, one warm and the other cool, having been mixed to the required proportion, are not broadcast haphazard through the chamber in a single stream. They are sent out in eight separate streams from as many special plants, each providing the area it serves with whatever temperature is necessary at any particular moment for that area.

Another novel feature is that the air is made to travel horizontally instead of vertically. Moreover, it periodically changes direction in the lower part of the chamber through being admitted first from one side and then from the other. In consequence, according to Dr Faber, the unpleasant effect of a continuous air-current, however low its velocity, will be eliminated. In addition, this variable air direction will tend to produce a more lively state and simulate the natural conditions of variable air speeds that are encountered out of doors.

Air was introduced into the old House at the rate of 40,000 cubic feet per minute. Experts held the view that this volume was excessive, and it has been reduced to 24,000 cubic feet. The task of changing the total content of the chamber eight and a half times per hour is equivalent to the movement in that period of 450 tons of air.

Altogether, it seems as if M.P.s have provided themselves with perfect working conditions.

Turkeys' Plaint

In harvest-filling, farmhouse grounds
The turkeys' piping grievance sounds,
Nor does it comfort their distress
That corn be spilled in rich largesse.

What flimsy warranty have I
To mourn the glow of summer sky?
They have the best right to complain
Who may not hope for spring again.

VERA LUKE.

The Simple Life

My £22 House in Hiva Oa

JOHN ROLLEY

YES, you *can* get away from it all, even in this atomic age. I realised that as soon as I stepped ashore on the dream island of Hiva Oa in the Marquesas group of French Oceania, which I reached by way of Tahiti, 700 miles distant.

As I headed for Atuana, the chief village, the only luggage I carried was in a canvas seabag—a few clothes, a large bush-knife, a camera, soap, some files and fish-hooks, a variety of vegetable and fruit seeds, and a few thousand Tahiti francs.

Almost at once the islanders came out to meet me, some speaking their own Marquesan language, which resembles New Zealand Maori, others French. Several invited me to follow them to their homes. They said '*Haere*,' and beckoned in the typical Polynesian style by opening and closing their fingers with a downward motion of the hand. My only problem in finding accommodation was to decide which of the numerous offers to accept.

EVENTUALLY I went to stay with Tamatoa's family. Tamatoa was the village baker—so long as the flour lasted—and one of the leading men of the village. His dwelling was a neat one-roomed cabin, built on high blocks. The roof was of plaited coconut fronds and the sides of split-bamboo. There were no windows, but portions of the wall were hinged so that they could be propped open to admit light and air. A few wooden steps led up to the interior, which was modestly furnished with a large double-bed, a form, and a simple armchair. On the bed was a home-made mattress, fully nine inches thick, filled with fluff from the kapok-tree. It was covered with a beautifully embroidered 'tiwaiwai' (quilt) of many colours. The chest stood in a corner and served as an extra seat. In it were the household and personal linen, the domestic cash, and a few other little treasures.

Teura, Tamatoa's wife, was a girl from Tahiti, who spoke French well, besides the Marquesan and Tahitian languages, which differ considerably. Their children, ranging in age from two to eight years, were healthy, captivating little creatures, with smooth, brown skins.

On the first night, I was shown to the big bed in the little room. I protested that I would rather sleep on a mat on the floor, that Teura and the baby should have the bed. But no, they were quite firm. They would all sleep underneath the house on their pandanus mats, amongst the house-blocks. And sleep there they did.

Next day I delivered an ultimatum that unless they all carried on as usual I'd stay somewhere else. I told them I really preferred sleeping on a mat on the floor, because the kapok mattress was too hot; that I liked simple native foods, and wanted to help with the work. Gradually they returned to normal. Within a day or two I felt I was one of them, sharing their daily life and fun. The magnificent double-bed was untenanted. We all stretched out on our mats.

AFTERWARDS I asked Tamatoa about having a house built, and how much it would cost—one like his. Tamatoa said he would build me a home even better than his, with two rooms, for 4000 francs (£22 sterling). What's more, he offered me free choice of any section of his extensive land on which I might like to build. The land I selected would

be mine for as long as I cared to stay—even if it was for the rest of my life. So I picked a site in a secluded valley with rich black fertile soil—a valley which ran down to an enchanting crescent beach of yellow sand.

Next day Tamatoa gathered five of his friends, and they all set out for the bush armed with axes and knives. I went, too, taking a good heavy Queensland cane-knife. We chopped straight pandanus trunks for the corner-posts and a large number of 'purau' saplings for rafters, stays, beams, and so on. The big job was carrying it all out of the bush on our shoulders, after which the bark had to be stripped for tying the timber in place. No nails were used.

While we were cutting and carrying, women and girls were busy plaiting coconut fronds for the roof. There were no plans, no estimates, no blueprints or permits, and no shortage of materials.

At the end of a week I had a neat, strong, brand-new native house, which would last about five years without repairs or upkeep. I was so delighted that I paid Tamatoa an extra 1000 francs, told him we'd have a big 'umu kai' to celebrate the opening, and that if he found and prepared the food I'd gladly pay for it.

What a feast that was! Every dish was of native food, and all cooking was either done in the 'umu' (native oven) or grilled on hot stones. Beef, pork, and chicken; delicious taro-leaf spinach, in coconut-cream sauce; sweet potatoes, baked bananas, breadfruit, yam, bonito fish, and lobster. For sweets we had arrowroot and pawpaw pudding, with coconut jelly and cream. For dessert—oranges, pineapples, and mangoes, to mention only some of the good things.

So many presents were bestowed upon me that I was embarrassed. The villagers had thought of everything from a commodious kapok mattress and sleeping-mats to subtly-scented coconut-oil, a fishing-spear, and a coconut-grater.

Tamatoa said to me: '*E kimi au i te vahine ia koe*' ('I will find a cook-housekeeper for you'). I thought this was a good idea, but wondered about the expense. When Tamatoa mentioned £1 a month, I—well, naturally left the matter in his hands.

MANEA was the name of my 'vahine,' and a better cook-housekeeper there never was. Besides that, she was adept with the fish-spear, and could climb coconut-trees, and set snares for wildfowl. Together we went fishing for prawns in the creeks, or gathering oranges and bananas in the bush.

I made a garden, and grew carrots, lettuces, tomatoes, budded some orange-trees, and set up a colony of bees near home.

Manea sometimes used to borrow Teura's old-fashioned sewing-machine. I was surprised at the neat work she accomplished as her nimble brown fingers pushed and pulled at the gay 'pareu' cloth. As a surprise for her, I had a shining new machine brought in on the schooner from Tahiti. Had I presented her with a luxury flat and a car she could not have been more delighted.

At the bank in Tahiti I had deposited £300, but I didn't use half of it. Yet I had all I needed. Food literally cost nothing more than the effort necessary to catch, collect, grow, and prepare it. There was time for reading, writing, swimming, and resting. The things which had to be done—the necessary little duties—were neither tedious nor boring.

From time to time we found we had odd items to sell or exchange for something we fancied from the schooner's trade-room. For instance, in exchange for surplus garden-produce, a fat pig, or some poultry, we could have a cotton material, fish-hooks, soap, and so on. I sometimes dried copra and sold a few bags on the schooner. Thus we always had a few hundred francs in case of emergency.

Of course, I realise a primitive life such as this wouldn't suit everyone. But it suited me.

Although there were no cars on the island, and not even a bike, there were wild-horses which could be caught and broken in for riding and packing. And I certainly did not miss newspapers, picture shows, electric-light or other modern conveniences.

By all simple, essential standards Hiva Oa is the most civilised place I know—and probably more like Eden than the Garden. For, though it does not lack Eves, you will look in vain for a serpent.

Temptation

C. MOFFAT

THE old limousine was stiflingly hot. Its leather upholstery, cracked and split by wear, allowed portions of the underlying horsehair to come through, adding a pungent scent of its own to the mingled odours of hide, varnish, and black serge well sat and well warmed by its wearers. The holland curtains which covered the windows and the glass dividing the driver from his passengers were securely held down on hooks somewhat clumsily inserted into the carriage-work. Behind them, an inch, no more, of lowered window allowed the minimum of air to penetrate. There was a gentle rhythmical snoring.

Sœur St Gonzague's eyes had been fixed on the nearest curtain for some moments, at first idly, her finger still holding the place in her Office-book against resumption, and then with an almost painful concentration. From the casual interruption of a frenzied buzzing against the pane, witness to a bluebottle's second thoughts as to the interior of the car being preferable to the road outside, she had reached a point where speculation on the lifting of the nearest curtain-loop excluded anything else. It had been an instant's work to flick the bluebottle in the direction of freedom without actually lifting the curtain. But if one had. If, for example, one leaned forward and detached that other loop on the partition, one would at least see where one was going, see beyond the black alpaca and the creased neck of Matthieu, driving with such deadly slowness.

Sœur St Gonzague's hands felt slightly moist with the effort of keeping them immobile on her lap. To see what her travelling companion was doing, even though by ear it was sufficiently obvious, meant turning one's entire head, since the starched and wired coif precluded, deliberately, any but a forward view. Religious did not glance aside. Like a blinkered horse. Sœur St Gonzague shied away from the slighting and unasked thought, rebuking herself the more strongly as it returned, and then found herself trapped in the weakness of excuse.

It was impossible, cooped in this airless box, not to imagine to oneself the freshness outside—the lime-trees flanking the roads (her nose at least had lost nothing of its sharpness), the stretching fields. One knew by the complaint of the dilapidated springs when the road was cobbled and a village, just as one knew the plunge into the country again even before the clouds of white surface-dust had risen and penetrated the car.

And before their destination was reached would there not be a scent of gorse, and perhaps the astringent smell of the sea, since the extern portress had said that the road to Croix-en-Vie crossed the common, or rather sandy waste, which fringed the estuary? How long was it since she had seen the sea? She really could not remember. Her memory got worse and worse for anything outside the daily round. At Matthieu's pace (she fished under her leather belt for her watch) it would be another hour, quite that, before they could reach the sister house, where a formal visit of courtesy was to be made on a new Superior. Another sixty minutes of stretching one's ears for sounds and imagining their equivalent sights, when by lifting a corner of fabric, by breaking an assured rule, of course, one would see as well as hear.

That one should want so trivial a gratification with such absurd intensity ranked it as a temptation. Someone had said, how rightly, knowing human nature, that one should never stop to argue with a temptation. It was the first step to concession. Shifting slightly on her seat, Sœur St Gonzague bunched a

superfluity of serge to one side in the effort to achieve a little coolness. Beside her, Sœur Vianney murmured something incoherent, her eyes still shut, her freckled hand moving blindly across her knee for the accustomed feel of her book. Sœur St Gonzague did not hear her. She was still looking at the facing curtain, no longer with a feeling of frustration, but rather as if it were the cinema-screen she had never seen, a background for moving pattern.

MAMAN had always been so fond of the salon curtains. They had been bought in Paris. The graceful almond-green fabric, with its pattern of silver-grey and pink, spoke of something more sophisticated than the remainder of the furnishings, the substantial oak and pearwood pieces handed on from one generation of good provincial commerçants to another. One could step through those curtains on to the wrought-iron balconies, and from there look down on the main-street below. A little French provincial town—its affairs very small indeed, far smaller than they had seemed when, as a child, they had been viewed from a second-floor balcony, and through childhood's magnifying vision.

On winter afternoons one could stand flattened against the panes, drawing the curtains close, feeling the thick tasselled fringe harsh against bare legs, and thus tented, hidden from the room, remain until Maman discovered one's whereabouts. Sharply she could remember. Maman's clear voice pitched on a note of incredulous amazement that any child should so misuse good stuff. Her reminders (Sœur St Gonzague's face wore an unconscious smile) that in the distant future Petite would learn to care for good things in a home of her own. Maman's hand drawing one back into the centre of the room, the circle of lamplight, to the table with its coffee-tray, its fluted pink glass dish of brioche, its wooden box of chocolate. Maman's fair and careful portioning out of the *goûter*, and her reiteration that it was a privilege and not a right.

How clearly Maman saw right and wrong, fair and unfair. How free her brisk decisive temperament had been from the introspections which had dogged her daughter. Curious how her own life had seemed always to be that of an onlooker rather than of a participant. A window had always been her portion—except of course in the Noviciate, where the windows were ranged high in the walls, not to be looked from, and with assurance made doubly sure by the filling of the lower panes with clouded glass. Only, into the clear space of the upper ones would drift the clouds, an arc of swallows, would come the tap of branches, and in winter the soundless smudging of snow. One became habituated there to thinking of windows as something out of reach, of their being an opening from which the outside world would momentarily impinge on consciousness, to be as quickly forgotten in the unending of the day. Not like the windows at home. No.

Even less were they like the windows of the little house Papa rented each summer from a retired grocer and his niece; an unpretentious little whitewashed place, buried in a garden whose luxuriant growth defeated all the controlling efforts of its elderly owners. Every summer it was the same, with the reassuring sameness beloved of childhood. The journey which started at dawn, the cramping hours in a slow train, the last jolting stage in a horse-carriage, feet buried in straw whose dubious cleanliness was witnessed by a host of ankle bites next day, and the climb up narrow stairs, propelled from behind my Maman's hand to oblivion in a feather mattress.

Only extreme youth, she realised it now, could have allowed for next morning's wakening without a trace of fatigue, a wakening which was something apart, to be remembered and retasted for the rest of the year. To push back the white calico drapes to a consciousness of the whiteness of the morning light, the rippling reflections on the ceiling, and to see across the narrow room a window of brilliant emptiness, nothing within its containing frame but light, and only when the floor had been crossed in a tiptoe rush (Maman and Papa sleeping off the journey below had no taste for a six in the morning awakening), to meet the breath-taking vision of the sea—sparkling, immense, uncluttered, as are earthly horizons, by perspectives of up and down, by vistas of exhausting detail. How satisfying that spacious vacancy, how perfect the small sound of water washing the unresisting slope of sand and shingle; and how superfluous seemed the sudden intrusion of a fishing-boat's sail, and sharp cry of a gull. Why, she wondered now, should it be counted one of the consoling promises of the Evangelist

that there should be 'no more sea.' Would man really be advantaged or consoled by such an ending, even by a termination of its winter face, grey and heaving, the fretwork of spray and the muted thunder on the beach?

How often when she had found her vocation had she asked whether there were no Order concerned with the sea, with those whose life and work it was, with suffrages for the souls of they to whom it had also been an end. How frustrating had been the solid incomprehension of the priests consulted, the oft-reiterated phrase that such an affection for created matter touched on illusion. Consciousness of her own clumsy and inadequate explanations had finally driven her back upon silence, on acceptance of the strictly cloistered nursing of deficients, which she had been assured was her true vocation.

IT was Sœur Vianney's snore, pitched on a deeper note than usual, which recalled Sœur St Gonzague abruptly to her surroundings. Her hand slipped again under her belt for her watch. Twenty minutes to go. They should be on the outskirts of Croix-en-Vie then. She suddenly sat bolt upright, flushing at her own dullness of wit. They must be passing the estuary now, the sea would be on the left-hand side, her side, of the car. Her hand had detached the nearest curtain-loop before she had conscious knowledge of the action, before it so much as crossed her mind that the sudden movement might have awoken her companion. It was even as she lifted the holland, her lips parted and her matter-of-fact features lightened by a fugitive expression of youth, the hopeful expression of the very young who see a longed-for treat, that the furniture pantechnicon which had trailed them for some miles finally lost patience with Matthieu's speed and decided to overtake. In a cloud of churned up dust it roared first parallel with and then past the window, its red-lettered sides effectually blocking out everything else.

'Aïe.' Sœur Vianney, jerked into awareness of discomfort by the noise, was thoroughly awake. 'Fortunate indeed we are not to see those nasty noisy things—fortunate indeed.' She voiced her platitude in the flat intonation of one who has said the same thing many times before, and will say it many times again, without giving much thought to its content. One would have thought her mind was already on the things to be said to the Superior in a few minutes' time—one would wish to be agreeable—but it was difficult to know whether the faded grey eyes behind the thick lenses were in fact oblivious of her companion's expression, of her shaking hands, and of a curtain of which one loop hung loose and flicked to and fro in the heated air.

Autumn Leaves

Rain-wet leaves are glistening
In warming sunshine's smile,
Whispering, and listening
With unobtrusive guile,
Wondering, among themselves,
As dear friends float down,
How long they may evade the elves
Who turn them golden-brown.

Neighbour after neighbour falls,
Space grows on naked space,
And near, a lonely leaf recalls
Green buds and summer grace.
'Oh, gently, gently, breeze. I'll die.
No need to tug so hard.
And kindly don't pretend to try
To catch me off my guard!'

P. M. BIRD.

The Unnecessary Rat

DAVID GUNSTON

ONE of the worst of centuries-old evils to which we have been heir is still with us in appalling degree. Rats continue to plague us as they do the entire civilised world, and, after long years of effort in destroying their prolific hordes, a teeming population remains to damage or ruin some £25,000,000 worth of food and raw material annually. Recent legislation aims at ironing out some of the many administrative problems the national rat war gives rise to, and official propaganda about the rat menace is to be stepped up in a great effort to bring home the facts to the whole nation. This is vital, because all the latest scientific resources of rat destruction are ineffective unless there is a strong public will behind them. Persistent apathy and complacency about rats is hampering their eradication from our midst, and it seems unfortunately true to say that until everyone grasps the real significance of the rat question, and plays his part in the general campaign, little real impression will be made on the many millions of rats which prey upon us.

Apart from the actual consumption of foodstocks, rats do a great deal of harm by fouling and spoiling them. They spoil ten times as much food as they eat, always ransacking dozens of bags or packages when their needs would be met by one. Many outbreaks of fire in large buildings have been traced to a single rat gnawing through an electric-cable, so causing a short-circuit. Then there is the untold harm that these animals do by spreading the bacilli of disease around. Bubonic plague, typhus, dysentery, Weil's disease, equine influenza—these are but a few of the ills which are carried by rats in their filthy fur. There is no other animal which transports such a variety of germs in its pelt as the common brown rat, but since it may in fact subsist on sewage and nothing else this is hardly surprising.

With this rather black picture before us, there are two obvious questions: Why has this state of affairs ever been allowed to come about? What are the prospects of completely annihilating these vermin? To a great extent the rats in Britain have been increasing without appreciable setback for many hundreds of years. Some say they now equal the human population numerically, and exceed them in sheer fecundity. There is no known way of taking an accurate census of our native rats, but such views may well be about right. During the 19th century what efforts at rat extermination were made were largely rendered valueless because of human interference with the natural enemies of these rodents. The thoughtless destruction of great numbers of kestrels, weasels, stoats, owls, and other predatory creatures resulted in the increase of the vermin. To-day such destruction is lessened, but these useful allies in rat and mouse control are still persecuted in some areas where they might better be left to carry on their own good work. We certainly need all the allies we can get in this matter.

THERE are two kinds of rat living in this country. Both were originally brought here by ships, and, although they are readily distinguishable in appearance, and even in habitat, there is little to choose between either species. The sleek, tapering black rat has been known in Britain longer than its brown cousin. It arrived here in the 13th century, brought back from the Mediterranean area, it is said, by the returning Crusaders. It introduced the plague to these shores, as it has done to every country it has colonised. The black rat originated in India and has invariably been the traveller of the rat family. It is still the ship rat, and is most numerous

in dockside towns, although it sometimes occurs in inland towns where it lives, often unsuspected and unharried, in the upper storeys of buildings and in attics and lofts. Its marvellous climbing powers fit it for this elevated existence, and, once in any building, it will nearly always move to the top.

The real threat is, however, the common brown, or Norway, rat, which came here about 1730 from Europe, and which has established itself in every corner of the land, being as prolific in towns as in the country, where it favours farms and hedge-banks. In urban areas it lives everywhere, from sewers to museums and zoos. For sheer cunning and adaptability the brown rat is hard to beat, and the gaunt old patriarchs, often as big as young rabbits, that rule the communities are tough customers to secure. They know all the dangers of traps and poisoned food, letting their descendants try out anything new before they themselves will touch it. Whether or not these individuals actually instil additional cunning and suspicion into their families, or whether such characteristics develop naturally in all rats, it is hard to say, but the fact remains that rats are getting even cleverer as more efficient ways of killing them are perfected. They all have an intense hatred of whatever is new, and poison baits have to be continually changed and methods altered to counter this innate suspicion, which may well ruin days of effort to get at rats in their underground haunts.

Rats never starve, no matter how hard the times or the area in which they live. It is said they can foretell impending disaster—and everyone knows of rats deserting a doomed ship—but at least they can certainly find adequate sustenance wherever they are. And if supplies of food and the very necessary water without which brown rats would perish do run out, the rodents migrate to fresh fields. They do have an uncanny knack of getting to know where supplies of food occur. In fact, the periodic migrations of town rats, either for the following of food-stocks or for breeding purposes, are one of the biggest headaches for the modern rat-catcher, or, as he is nowadays called, the rodent operator.

It is true that if rats are starved they will disappear, and rubbish-dumps, stocks of waste food, and so on, only provide further encouragement for them. Yet they merely move elsewhere. The pursuance of this maxim was one of the graver faults of the old-time rat-catcher. He did get rid of the rats in his area by cutting off all their available food, but he simply drove them elsewhere. To-day all rat destruction is worked out on the widest possible scale, and the aim is to extirpate rats, not just to drive them about the country.

THE intelligence of rats is legendary. It has been proved that many rats habitually use overhead telephone-wires to cross the streets of towns at night. At one port rats were actually seen stuffing their holes with rubbish and rags to keep out the noxious fumes which were being used to fumigate the ship on which they had arrived in England. In their efforts to obtain food rats will employ all manner of devices. They will climb trees to eat the fruit and will roll eggs back to their holes between the chin and forepaws.

A rat's teeth are extremely sharp and grow constantly. They can be used to gnaw through almost all substances except concrete, and lead pipes have often been severed by rats seeking water. This renders it extremely difficult to make any building totally rat-proof, and also to keep rats on, or off, ships moored at ports. The familiar circular rat-guards on mooring cables are effective enough, but rats sometimes leave vessels by the anchor cables or simply by swimming to the quayside.

Few people have really seen the vast armies of rats which are known to travel overland at night, but there is no doubt whatever that whole communities will on occasion migrate in this fashion, usually when hunger dictates such movements. An incident witnessed by a clergyman some years ago gives further proof of rats' ingenuity. Amid a host of migratory rats was a very old, blind specimen carrying a twig in its mouth, the other end of which was held by another rat, who was guiding the blind one along.

WITH such clever creatures it is clear that no half-measures will ever be successful. Nowadays the battle against Britain's rats is fought on the widest possible scale, and the attack is carried deep into the enemy's camps. But it is also like conducting a protracted war inside a friendly but non-co-operative country, for, generally speaking, rat control is not aided by the public attitude towards rats and their limitation. No method

is too trivial or too involved to ensure their destruction. The old-fashioned rat-catcher with his terriers, his sticky-boards, and his traps has all but been superseded by the more thorough and more scientific rodent operator of to-day, who works for the numerous local authorities under planned organisation.

The principal means of rat-killing at the present time is by judicious poisoning in the actual lairs and haunts. The sewers of all towns are periodically dealt with by gangs of trained men. Quantities of innocuous food, usually dried wheat or powdered sausage-rusk, are laid through manholes and outlet openings for several days in succession. By a careful inspection of the amount of food eaten a fair census of the local rat population may be obtained. After three or four days' tricking in this fashion the rats are lulled into a false sense of security. Once a bait has been found and laid that they will take, the process continues cautiously. If they keep on eating the food regularly, what the rat men call the 'blitz' is then put into action. The same quantity of the same bait is now placed in the same spots, but this time it has been heavily poisoned with zinc phosphide or arsenic. Next morning, the sewers are again inspected, the dead bodies counted, and a rough estimate of the night's kill, or 'take,' can be made from the amount of poisoned food eaten. If necessary, the process is repeated several times until the majority of the suspected population are known to have eaten the poison. Often the dead rats are not discovered, but get washed away with the mass of ordinary sewage.

The vast refuse-dumps that regrettably dot the countryside, especially just outside towns, are another battlefield in the anti-rat war. These places are happy hunting-grounds for countless rats, particularly in the spring and summer months. They are trapped with short lengths of drain-piping placed inside the dumps and well baited with poison. The rat-catchers also seal up all the open holes of the rats which live under these rubbish-tips, and those that are reopened in a day or so are similarly dealt with. Terriers and guns may pick off odd specimens which happen to be driven into the open, but only systematic poisoning can possibly cope with the large numbers that are encountered at such places.

Ships are generally fumigated with cyanide gas, and the dead rats removed. Trapping is reserved for confined spaces, as in factories, shops, and warehouses, and where the storing or handling of food makes the use of strong poisons undesirable. Only by continued efforts are rats eradicated from some buildings of this kind, since they live in cellars and attics, and lurk at the back of goods being stored. The rodent officers of the local authorities, whose work is, nowadays, supervised by and aided by grants from the Ministry of Agriculture and Fisheries, will always inspect premises where infestation is suspected, and they advise on the best means of guarding against the spread of rats, by correct storage of foodstuffs and raw materials, disposal of refuse, and so forth.

BUSINESS concerns have to pay for their rat destruction, but it is not widely known that private householders may call in the local rat-control representatives to rid their houses of rats or mice, without charge. Everyone is under legal obligation to have rats or mice in any buildings removed and destroyed. Incidentally, the old device of offering rewards for rats' tails by way of inducement to kill the pests is rather frowned on by the authorities because it means the handling of dead rats. This may lead to serious infection from the diseased pelts. Dead rats are best burnt or deeply buried as soon as they are killed.

Research into improved methods of destruction goes on apace, and even more potent poisons, like the new one called Antu, $\frac{1}{200}$th of an ounce of which will kill a brown rat, are being developed alongside better means of dealing with rats that are firmly installed in built-up areas. But total eradication will not be in sight until the present apathy about the rat menace is converted into a resolute will to see that these relics of the Middle Ages are finally wiped out. The public conscience has yet to be stirred on this point. Everyone who harbours a single rat without reporting or dealing with it is holding up the day when we can feel perfectly safe from the depredations of these unnecessary parasites.

Herald of the Chase

The History of the Hunting-horn

J. M. BRERETON

'DULL must be the warmint wot does not lift up 'is 'eart at the twang of a 'untin'-'orn!' exclaimed John Jorrocks. The horn, indeed, represents something that is essentially English. Like the sport it heralds, it has been with us through the centuries. It is a tradition.

To seek its origin in this country we must go back to the days when the Norman lords rode their newly-conquered Saxon forests after wolf and deer. They and their huntsmen carried a natural ox-horn, of the type seen to-day on the head of a Highland steer. Slung round the shoulder by a gaily-coloured baldrick, it was frequently embellished with silver mouthpiece and bands, and sometimes inlaid with precious stones. It produced a single, booming, rather melancholy note. This primitive instrument survived, unaltered, for several centuries until, about 1300, it was eventually ousted in favour of one of metal.

In his *Maystre of the Game* (1413), Edward, second Duke of York, describes horns made of copper, brass, and silver. He advises 'that a good hunter's horn should be driven of two spans in length . . . and not too crooked, neither too straight, but that the flue be two or three fingers uppermost than the head (bell)....' The mediæval horn was thus about eighteen inches long, and, like its predecessor, was slightly curved. A curious custom of greasing the horn with green wax was also recommended, apparently with the object of improving the tone quality.

For many years this kind of horn, usually of brass, remained in vogue, but at length, during the latter half of the 17th century, there arrived an innovation from France. This was the large circular instrument which is the prototype of the modern orchestral horn. It is said to have been introduced by the Marquis de Dampierre, a talented nobleman and keen sportsman who flourished in the reign of Louis XIV.

A somewhat cumbersome object, this French hunting-horn completely encircled the shoulder and chest of the huntsman. Possessing, moreover, a compass of twelve notes—rather similar to the present British army trumpet—it was certainly the most versatile instrument that has ever graced the hunting-field. It demanded no little skill in performance. Though it never gained much popularity in this country, on account of its unwieldiness and the skill required to wind it, it still remains the orthodox form in the country of its origin. French hunts, retaining more of the traditional ritual and pomp of the chase, often boast from four to six horn-blowers, who sound the calls, or 'measures,' in harmony.

IN the early part of the 18th century, when our squires began to favour the fox as their quarry rather than the hare, varying types of horn were in use. There was the old curved form, still made of brass, but shorter than its natural ancestor; it survives to-day in the badges of our light infantry and rifle regiments. Then there was the hunting bugle, very like the modern army bugle, though smaller, with one twist, and normally of brass rather than copper. Finally, in one or two packs, one might have seen the more direct ancestor of the instrument carried by our present-day huntsmen—the straight horn.

The straight horn arrived in the field about 1750, but it did not become generally popular for another century. At first it was much longer than the modern variety—commonly about eleven inches or one foot—and, though copper was occasionally used in its making,

brass continued to be the more favoured metal.

One of the earliest and most renowned champions of the straight horn was the great sportsman, Peter Beckford. In his classic *Thoughts upon Hunting*, published in 1781, he declares: 'If your coverts be large, you will find the straight horn of use: I am sorry to hear you do not approve of it. You ask me why I like it. Not as a *musician*, I can assure you. It signifies little, in our way, what the noise is, so long as it is understood.' The new instrument, indeed, proved not as musical as the curved or twisted forms; but its note carried farther, and in those days of woodland hunting this was a matter of importance.

One should, perhaps, recall that the original object of horn-music was not primarily to encourage and direct the hounds, as it is nowadays, but to inform the field of the progress, and of the master's intentions. The country was much more thickly wooded formerly, and, as the field might frequently spend the whole day without a sight of hounds, it was more necessary that the huntsmen should have some means of discovering what was going on. Hence a great variety of intricate calls were employed. Similar circumstances exist in France to this day, which is one reason why the old circular compassed horn has survived with the French hunts.

By the time that Surtees had created his immortal Mr Jorrocks—that is, in the 1840s, or the heyday of English hunting—the straight horn had come into its own. It had finally ousted all its rivals, and, as we have seen, was destined to become the accepted emblem of the English chase.

TO-DAY the hunting-horn, for practical use, is invariably made of copper. Experience has proved this metal to be more resonant than brass, and it produces a more penetrating note. Thus, our cavalry and artillery trumpeters employed the copper bugle for calls in the field and the brass trumpet only for ceremonial purposes and routine calls in barracks. The mouthpiece of the horn can be of sterling silver or German silver, and its lips should be broad, with a smooth, rounded edge. For presentation purposes, hunting-horns are sometimes made entirely of sterling silver, embossed with artistic designs and inscriptions. These silver horns are of no great use in the field, for, besides being harder to blow, their tone has a certain veiled quality, which, though musical, is obviously not desirable. Nine inches is regularly regarded as the maximum length of the modern horn, and its single note is usually the D in the treble clef.

As every novice speedily discovers, horn-blowing is a difficult art, and one that can be acquired only by diligent practice. The sound is produced solely by lip-tension and pressure of breath forced out by a spitting action of the tongue. Those who despair of ever being able to make anything but rude noises may console themselves with what is known as the reed-horn. In appearance this is very like the normal instrument, except that the shank—where the mouthpiece fits—is slightly thicker. This shank contains a thin tongue of metal which vibrates when blown upon. The principle is similar to that of the child's toy trumpet, and very little skill is required to produce a satisfactory note. The disadvantage is that the tone possesses a thin, metallic timbre which can never be as melodious as that of the true horn. Furthermore, the note does not carry well.

Since the War there has been a remarkable revival of interest in horn-blowing as an art, and a highly-popular innovation has been the inclusion of contests at sporting events and hunt balls. The blue riband of such contests may be said to be the award at the annual Horseman's Ball, held in London. In 1948 this honour went to Mrs R. Whitehead, formerly Master of the Monmouthshire, who thus achieved the added distinction of being the first woman to win a hunting-horn competition.

Epigraph

Two red roses on one stem—
Gently, Gardener, gather them.
Fair as in their lives to see,
Oh let them not divided be.

S. THOMAS ANSELL.

I Ran Away to Sea

RIMO

I THINK that one of the reasons which prompted me to run away from school was that I hated the clothes we had to wear! Our school outfit was, I suppose, the usual style of dark coat, grey flannel trousers, and a tie. I loathed the tie. The trouble was that I had never worn one before, since I had been born in the sunny climate of Kenya Colony, where at school we wore khaki shorts and an open shirt. At any rate, I disliked my new clothes in this cold grey island where it never seemed to stop raining.

And so it was, with a muddle of thoughts at the back of my mind, dominated by the idea of escape and 'freedom,' as I fondly conceived it, that I ran away to Bristol at the age of fourteen in order to join the Navy. Many boys have done so before and probably will continue, if they can, to 'run away to sea.' I have not since regretted it at all. But I confess I had some preliminary doubts during that first week.

I was one day under-age, according to King's Regulations and Admiralty Instructions, when, on 29th August 1934, I signed on at Bristol. I received the sum of seven shillings and sixpence from the recruiting-sergeant, and next day—probably the most miserable birthday I have ever spent—I travelled from Bristol to London. On arrival, I went to report at Whitehall, where I imagined I would be interviewed by at least an Admiral or a First Sea Lord. I was, in fact, taken charge of by a sergeant of Marines.

Together with about thirty others like myself, I was herded across London and entrained for Harwich. A burly petty-officer gave us the order 'Disembark,' and we were fallen in near where the waters of the rivers Orwell and Stour merge and join the North Sea. We were met by a steam pinnace. Climbing down a steel rung-ladder, I overshot the mark, and was only hauled up in time to save myself from being wedged between the gunwale and the pier. My strongest impression of those moments was being fascinated by the bell-bottom trousers of the bowman as he dexterously held and pushed us off from the pier to H.M.S. *Ganges*, which lay on the farther shore.

H.M.S. *Ganges* was the Royal Naval Training Establishment. In fours we were marched to the 'Quarter-deck,' which was merely a roadway with an administrative office-block on one side and boys' messes on the other. In the centre was a flag, flying the commissioning pennant. Halted on the 'Quarter-deck,' we were given the order 'Left turn.' Most of the boys knew not left from right, and sharp reprimands were barked out by the petty-officer. Soon we were all facing the administrative block.

Out of the doorway came the officer of the watch, wearing frockcoat, sword-belt (but no sword), and telescope under his arm. His first words were: 'You will now hand over all smoking material to the regulating petty-officer—that is to say, all cigarettes, pipes, matches, cigarette-paper. From this you will understand that in these barracks you are not allowed to smoke. And the reason is not because smoking does you any harm—it doesn't, not because you will set the barracks on fire—you won't, but because the King's Regulations and Admiralty Instructions state that you are not allowed to smoke.' Such was my first introduction to naval discipline.

After handing over our smoking materials we were marched off to supper, which consisted of a form of stew known as 'Shotley mystery.' A number of boys were detailed to wash up the cutlery and plates. I was sent to mop up a bowl of cocoa someone had spilt on deck, when suddenly a big petty-officer bawled

at me: 'Does your mother do it that way?' Thinking of my mother's home in Africa, with our black servants, I replied: 'My mother doesn't do it—the boy does.' Needless to say, this was not the right reply, nor a good beginning of my relationship with the particular petty-officer.

I SHOULD explain that the total complement of boys in these naval barracks was about two thousand. There were nine divisions, and in our own block there were four messes. The sixty new boys I was with were in what was called a 'preliminary block.' In my ignorance I rated the boys in the other three messes of the block as 'old-timers.' Actually, they had only been in barracks for two or three weeks.

On the day after arrival we were handed what was termed 'loan clothing.' This outfit consisted of bell-bottom trousers, a navy-blue serge jumper with the usual flap collar, and two shirts known as 'flannels.' One of these was worn with bell-bottom trousers and jumper; the other was marked 'Night Shirt,' in large capital letters. Nowadays, I believe, the boys are issued with pyjamas. Size of person was not taken into reckoning in this outfitting, which was, however, only to last for a few days, until we had our issue of kit. This was a considerable one, and included such items as three white duck suits—worn every day except Sunday, whether summer or winter—five flannels, brushes, boots, scissors, and so forth.

As we were drawing our kit, one small Irish boy near me received with joy his first round hat. He seemed worried because it was too small. 'Try another,' said the supply petty-officer. 'Oh no, sirr,' replied the boy. 'It 's not the hat 's too small, sirr, it 's me head 's too big!'

It was three mornings after 'kitting up' that our squad of 'nozzers,' as new boys were styled, were sent to the swimming-bath at four o'clock in the morning. It was bitterly cold and dark, and the water looked icy. A large physical-training instructor came up in a hearty manner and surveyed our shivering squad. 'What are you shivering for? It can't be cold. They 're going to light the fires in two hours' time to heat the water!' I decided not to be frightened, and plunged into the freezing water. Half the boys failed the test, which was two lengths of the bath and floating for two minutes in a duck suit. I was fortunate enough to get through, but the wretched failures had to report at the bath daily in all their available spare time. They thus had ten minutes' daily instruction and were termed 'backward kickers' until they passed.

As I have observed, spare time was limited to about ten minutes a day. The rest of our lives was filled with such things as sewing our names on the clothes we had just got, scrubbing the barrack-rooms, doing P.T. and, by no means least, squad-drill. This was not only forming fours and two deep, but was classed as disciplinary training. I have particular memories of the gunner's mate gesticulating and shouting: 'Right! Right! That 's that —— way. Now, right turn!'

Eventually the squad was issued with rifles. In the course of his explanations the gunner's mate said: 'When you throw the rifle across the body you do not waggle the swede. If you don't know what your swede is, it 's that piece of offal that holds your ears apart.'

Having mastered the rifle after our fashion, we were then sent to the drill and stripping battery, better known as the 'drill and dripping battery.' One part of the breech mechanism was called the screw-securing ring-returning breech screw-lever. Half-an-hour after being told this, I was asked what it was. 'Ring-securing breech-returning lever,' I replied. For this answer I had to hold a six-inch projectile, a weight of one hundred pounds, for thirty minutes. For the first minute it weighed one hundred pounds, but by the end of half-an-hour it seemed something like one thousand. I remember the name of that screw to-day.

ON passing out of H.M.S. *Ganges* after twelve months, with all exams behind me, I was drafted to the *Royal Sovereign*, and became a 'sea-going boy.' I was then sixteen years old. We went by train from Harwich to Devonport, and as sea-going boys we were allowed the privilege of smoking on leaving the ship. My main recollection of this first concession is that I made myself very sick.

It was dark on arrival at Devonport, and we were met by a leading-seaman and two able-seamen, with a handcart to take our luggage from the station to the ship. The big outlines of the war vessel loomed darkly at the quayside, and there were only a few lights on the quarter-deck.

On seeing my first ship with such a famous

name, I felt I was at last a real sailor. I was speedily disillusioned when on walking inboard I was greeted with : 'Come here, boy.' This came from a very smart officer of the watch, pacing the quarter-deck with telescope under his arm and sword-belt slung. I walked slowly over towards him. He said: 'When I call you, boy, you do not walk, you do not run—but fly! Whenever you step inboard one of His Majesty's men-of-war you will always salute. Go back ashore and come inboard again properly.' With this I 'flew' ashore again and came inboard saluting smartly, and was then told to carry on for'ard.

By now all the other boys had been marched away to the boys' mess-deck and I was left on my own to find it. As I look back on it, I suppose my predicament was rather comical, yet at the time I felt nothing but alarm and dismay—for there I was, left alone to find the boys' mess-deck amid the 25,000 tons of intricately-fabricated fighting metal of a modern battleship. I walked up and down for a little, gazing despairingly at the strange dark shapes which sprang up around me. At long last I came to a mess-deck where a tall man with a fearsome handle-bar moustache stood in a singlet and a pair of blue trousers with a red stripe down the side. 'Excuse me,' I said, 'is this the boys' mess-deck?' Fiercely he replied: 'Do I look like a —— boy!' I fled, and came to a highly-burnished steel ladder. To get down I tried slinging my bag over one shoulder and my hammock over the other. When I put my right foot on the top rung I lost control and finished up at the bottom. Here I found myself staring up at a burly A.B. who remarked: 'Try walking down, son—it doesn't hurt so much.' I was, of course, late when I finally reached the boys' mess-deck and received an order for 'bag muster' on the following morning.

My three months in the *Royal Sovereign*, after getting into the daily routine, were fairly uneventful except for the full-calibre charge shoot. Since one shell from a fifteen-inch gun cost the taxpayer one hundred pounds, these shoots were only practised once a year in peacetime, the other shoots being sub-calibre ones. On this particular day the order was given, 'Exercise Action.' I entered the turret, my action station being sight-setter on the right gun. I was terrified by the tremendous noise of all the machinery. More fear was put into me by the breech-worker when I pointed to the great barrel and asked him, 'Does this thing recoil?' 'Yus, cock,' he answered, 'yer loses the number of yer mess if yer tries to stop it!'

One other incident outside the routine stands out in my memory. We were alongside the quay, painting ship, and I was detailed off for the funnel. I shared a stage with an A.B. and could not help a certain nervousness as I looked down at what seemed the long space between the funnel-top and the stokehold-casing below. Unfortunately the A.B. did not help matters. He pointed over to the quay and said shortly: 'Yer see that over there?' I wormed myself round slowly and saw an ambulance on the quayside. It had evidently come to remove someone from the sick-bay of the ship to the shore hospital. I nodded in reply. 'Well,' he said, 'that 's come to take away the last —— who was up here with me.'

SO life went on until I had finished my time on the *Royal Sovereign* and was transferred to the six-inch light-cruiser *Delhi*, stationed at Haifa. Here I spent an unmemorable year at the time of Italy's Abyssinian campaign and also of fierce fighting between the Jews and Arabs in Palestine. From Haifa we took up duties in the Spanish Civil War Non-intervention Patrol between Valencia, Barcelona, and Majorca. The inhabitants of these towns were not unfriendly to British sailors even during civil war. Among them a bar of soap had almost as high trading value as a packet of cigarettes came to have in Germany ten years later.

From 'Spanish Ladies' I was sent to the Royal Naval Barracks at Devonport, and on finishing my entry routine here I started on a course at the Gunnery School. Part of this course consisted of a week at the range with small-arms. On the second day things became far from well when I discovered that when I closed my left eye I could not see the 6-foot target at 200 yards. I reported this, and was subsequently passed on through a hierarchy of officials, leading eventually to a medical board. At the end of my interview before the board I was directed to report to the pay-master's office. There I was given one month's leave and told to draw this pay and any other monies owing to me, plus fourteen shillings for a suit of civilian clothes! And so it was that I left the Senior Service with mixed feelings.

King Potato

EDMUND ROBERTS

THE first thing the relieved Berliners asked for when in May 1949 the ten-month siege was raised? No, it was not beer, but just potatoes—good, honest spuds. The food-trains, in fact, carried nothing else, and they clanked in over the too-long-silent sleepers at the rate of two thousand tons a day.

One can well imagine the Germans through that winter of discontent echoing with that old rogue, Sir John Falstaff, as he embraced Mistress Ford: 'Let the sky rain potatoes!' Unfortunately, despite the many miracles our men in the Air Lift worked, they couldn't quite manage that, and Berlin's millions had become just about nauseated with the emasculated variety called by that mongrelly concocted name 'dehydrated.' Potatoes were the city's greatest want, and never have real solid spuds—boiled, fried, chipped—been more welcome of late than on the banks of the Spree.

Which recalls that this is by no means the first time potatoes—next most important food in the world to wheat—have been an influential factor in international affairs, or in German history for that matter. A war was once fought over the potato. Rather more than one hundred and seventy years back, Frederick the Great was engaged against the Austrians in what was known as the Potato War. There has never been a queerer conflict, for the operations consisted solely of manœuvres designed to destroy the enemy's main food-supplies, potatoes, and to drive him from the potato-growing areas. Not unnaturally, at the end of a year's campaigning a lot fewer people were alive to eat what crops there were, for the war cost the lives of 20,000 men.

WHILE there is no doubt about the welcome 20th-century Berlin has given the spud, things were different in the olden days, for, when the potato was originally introduced from the New World to the Continent about four centuries ago, it got a cold reception, and German peasants manifested their objection by maliciously uprooting whole fields of the crop.

It is rather an extraordinary fact that, with all the beauty of the royal gardens at his command, Louis XVI of France wore the insignificant flower of the potato as a buttonhole. His idea was to popularise the vegetable, not an easy proposition, for his people would have none of it. Opposition continued down to the Napoleonic Wars, and not only untutored country folk but even expert agriculturists in many countries were up against cropping of potatoes on a large scale.

In short, potato rationing would not have bothered our forebears of a couple of centuries back, for much the same thing happened here as across the Channel. When the tuber first began to be known, both Scots and English turned up their noses at it, though with his usual warmheartedness Paddy took it to his bosom from the start. The wrath even of the pulpit thundered against the immigrant, and there is record of a strange sermon in a little kirk in Scotland about three hundred years ago. The old minister's voice rang out in earnest pleading with his flock not to touch the accursed food: 'My dear brothers and sisters—avoid this new-fangled vegetable like the plague. For though you search Holy Writ from cover to cover you will find no mention of it. How then can it be fit food for Christians?' Many were the crimes totted up against poor spud, among them those of spreading leprosy and fever. To crown all, many swore it was the 'fruit' which had caused the fall of Adam.

Actually, in Scotland antipathy to the

potato was not so much due to its being a newfangled item of diet as to the fear entertained by the working-classes that if the farmers devoted so much of their land to cultivation of the new crop it would result in a diminution in the growing of oats, consequently endangering the supplies of oatmeal, the people's staple foodstuff, which has raised so many generations of brawny Hielanders.

Among the Sassenachs, in vain did the government after the Restoration call in the aid of the wise men of England's oldest scientific body, the Royal Society, to urge the people to grow potatoes. They would have none of them, and, as an example of the die-hard prejudice against them, the case of the Holkham estate in Norfolk is worth mentioning. Here lived Coke of Norfolk, Earl of Leicester of Holkham, one of the greatest pioneer agriculturists of all time. He tried to get some of his tenants to cultivate potatoes by offering them land rent-free and by providing seed-tubers gratis. Then, having unwillingly grown a few, the tenants grudgingly admitted: 'Well, bor, they might not poison the pigs, but they're no fit fare for human beings.'

In the end the potato won the day, and, strangely enough, it was Scotland and not Ireland that did most to develop it from little more than a New World weed to a vegetable that has even taken its name from British kings and queens. King Edward potatoes are known to every housewife, and last century a Scotsman evolved the Victoria, then an aristocrat among spuds.

NOWADAYS there are well over five hundred varieties of the vegetable, but who brought the first potatoes from the New to the Old World is still a matter for learned argument. Sir Walter Raleigh, the Elizabethan sea-dog, is often given the credit for introducing them into these islands. But the poetical mariner, courtier, and historian—who certainly seems to have 'invented' tobacco—has a rival in that doughty sea-captain, Sir John Hawkins. And the Germans think they know better, for they erected a monument at Offenbach bearing these words: 'Sir Francis Drake introduced the potato into Europe in the year 1580.'

Whatever the truth, Raleigh undoubtedly cultivated the vegetable himself, but gained precious few converts in England. Old John Gerard, the herbalist, got a score of seed-potatoes from Sir Walter and planted them in his garden at Holborn, then a pleasant semi-rural suburb. Yet he grew them more as a rare plant than as for food; and as for cooking, nobody knew how to do this attractively. Gerard said some people used the vegetable abroad as 'ordinarie common meat,' but the methods he suggested sound strange to-day. One way was to 'roast them in ashes and sop them in wine,' and they were also steeped in sack, baked with marrow and spices, and even candied.

They remained a delicacy, and years later another writer described them as 'a daintie and costly dish for the table.' A housekeeping-book kept by Anne of Denmark, queen to James I, has an entry of the purchase of a pound of potatoes for two shillings. That would be equal to a ten-shilling note now. Methods of cooking do not seem to have altered much, for the writer spoken of stated they ought to be treated with sugar and spice—almost like all things nice.

Right till the time of the first George there is no mention of potatoes in English gardening-books. In fact, down to the last quarter of the 18th century, potatoes were found chiefly in the gardens of noblemen. It was the Napoleonic Wars which led to their rise to the status of a national crop. Bread was scarce, so much so that on one occasion when Nelson was out to dinner, and he asked for a piece of bread, he was told with apologies there was none, and he was offered a potato instead.

In this connection there is an interesting entry in the records of the Norfolk and Norwich Hospital in Norwich: '1800—Ordered that in compliance with his Majesty's Proclamation exhorting to an economical use of bread, a score of potatoes be purchased and that the Matron be directed to make use of them as a substitute for bread at dinner, both in the wards and in the House Department of the Hospital.'

THE increased potato crop had good effects upon the health of great numbers of people who until then had lived principally on salted meat and coarse bread, which was truly terrible stuff, if Smollett, the novelist, is to be believed. He swore that 'the bread I eat in London is a deleterious paste mixed

up with chalk, alum, and bone ashes, insipid to the taste and destructive to the constitution.'

Bluff old Dr Johnson had a word or two to say upon potatoes, as upon most matters, and he was a champion of the tuber. Talking to Boswell he remarked: '"Sir, a man bred in London will carry a burden, or run, or wrestle, as a man brought up in the country." Boswell: "Good living, I suppose, makes the Londoners strong." Johnson: "Why, Sir, I don't know that it does. Our chairmen from Ireland, who are as strong as any, have been brought up upon potatoes. Quantity makes up quality."'

The real fact was, of course, that from Elizabethan days, when the potato was introduced, up to very recent times the working-class both in England and Ireland were badly fed. The peasants in Ireland were the worse off, and, too poor to afford decent bread, the new vegetable proved a godsend to the ill-nourished masses. Right from the beginning Ireland welcomed the potato, and its people still cherish its history and show with pride and triumph the garden at Youghal where Raleigh first grew the plant that was to become for so long the staff of life to them, far more so even than bread. It literally became practically the only food of many of the people.

As for Sir Walter himself, to begin with he appears to have known just about nothing of the virtues of the potato. He had no idea, for instance, that the tuber was the consumable portion; indeed, was so disgusted at seeing no fruit on the flowering plants that he ordered his gardener to make a bonfire of them. Only then when the unoffending plants were yanked out of their bed did he see the tubers, and had them cooked. As it happened, he was one of the greatest Irish landowners of the time, holding 40,000 acres, and soon peasant and farmer followed his example in cropping the potato.

A CENTURY and a half later, the fashion had become a habit—more, a necessity, and sharp-tongued Swift, who bore the Irish no love, declared in one of his bitter moods: 'The families of the Irish farmers live in filth and nastiness, upon buttermilk and potatoes.' Not so long afterwards we find Arthur Young, justly regarded as the father of modern agriculture, describing in kindlier mood the Irish as a stalwart race, abundantly nourished on potatoes, as contrasted with the meagre diet of bread and cheese of the English peasant. Young spoke of a typical Irish household devouring an incredible amount of potatoes as well as 'fowls, turkeys, geese, and perhaps cow.'

That was in 1780, and Young's 'incredible amount' was no exaggeration, as the Board of Agriculture found eighteen years later when it inquired into the amount of potatoes being eaten in the isle. One man, his wife, and four children, it was found, consumed 336 lb. a week, equal to 3 cwt., or 8 lb. a day each. But that was by no means a record, for another family ate 12 lb. a day each, and in the workhouses every man was allowed 16 lb. a day!

No wonder, then, that when the potato failed, ghastly scenes followed. The trouble started early in the 1840s, but in July 1846, when the famous temperance reformer, Father Mathew, passed from Cork to Dublin he saw everywhere that the fields were green with a crop of unusual luxuriance, and the peasants were hoping for a harvest that would relieve their poverty. Then the terrible blight swept over the land, like the shadow of the Angel of Death, and in less than a month the potato-fields were reduced to a wide waste of putrefying vegetation.

The disease ravaged Holland, Belgium, Hungary, Germany, and these islands. Ireland suffered worst of all, and in six years a million starved to death. In 1846 a quarter of a million were put on relief-work; the next year three-quarters of a million, for the crop failed again. The government distributed maize worth £9,000,000, most of it free, and the U.S.A. also sent huge quantities of maize across. Even then, Ireland could not support her people, and a vast stream of emigration that drained the country of most of its finest stock set in. Within a decade a million and a half left to find happier homes in a New World.

Such were the truly-named 'Hungry Forties,' and the agonies of those famine years are immortalised to this day in story and in song. Still they speak of the horror of those dread times:

O, the praties they are small over here,
And we pluck them in the fall and we eat them skins and all,
Over here . . .

The fatal years caused terrific battles in

Parliament between those who wanted to repeal the Corn Laws and those who wanted to retain them. Eventually, the restrictions were thrown over and the price of corn was lowered to help the poor. It was an economic revolution, and the veteran Iron Duke summed it up in characteristic fashion: 'Rotten potatoes have done it all.'

The Craft of St Crispin

A SHOEMAKER

WORKERS in leather belong to one of oldest crafts in the world. In the Bible, one Simon, a tanner, is mentioned. He is referred to as showing hospitality to the Apostle Peter. St Crispin is the patron saint of shoemakers. He worked at his craft and preached the gospel in Rome about the 3rd century. The 25th of October is his festival day.

The old saying, 'There's nothing like leather,' as well as being an advertisement, has long been in use amongst members of the trade as an ironic expression of congratulation to one of their number who has been financially successful in the vocation.

The finest leather is called butt. This is an oxhide without any offal or pieces round the margin. It is usually the most expensive tannage for the shoemaker to purchase. The high cost is largely due to the process of vegetable tanning, which is a long one compared with mineral tanning.

Butt-leather, though soft and pliable after seasoning for use by the shoemaker, is unexcelled for flexibility and wear. For handmade shoes, only the best butt-leather can be used, as it has all the qualities which enable the craftsmen to mould it into shape. A hard type of leather is unworkable by the handsewer.

When you call on the shoemaker with your shoes for repair, there is a considerable choice of materials nowadays from which the soles for your shoes may be selected. In fact, these materials which mostly consist of varieties of rubber compositions are about equally in demand with leather. Their cushioning property and durability are factors which have brought these compositions into popular favour.

Shoemakers, however, often find customers returning with their footwear to have the artificial material replaced by leather. There are certain features about leather which science has not yet succeeded in reproducing. Like the skin of the feet, leather is porous, yet waterproof. It almost seems designed by nature for the purpose of footwear. It is cool in summer and warm in winter.

MOST people would imagine that a hard class of leather would wear longest, but this is contrary to experience. Hard leather grinds away on the roads and pavements, whereas good leather, which is comparatively mellow, absorbs the grit and sand into its grain, thus giving the soles a toughness like steel. Good leather is usually known by the closeness of its fibre.

Metal accessories, such as tackets, studs, and protectors, though helpful in making secondary grades of leather wear longer, do not prolong the life of good soles. The metal sets up friction which burns the leather and causes deterioration and leakage. This may be seen by removing the metal accessory. Round the holes where the prongs were inserted a brown discoloration will be observed, proving that the leather has been slightly

burned or corroded. Metal accessories, of course, are useful in the soles and heels of golfers' shoes for giving a grip on the turf. Some of those metal accessories are treated to prevent corrosion in their contact with the leather. In the old days when the village shoemaker made boots for ploughmen and shepherds, galvanised tackets fitted to the soles were popular. These tackets had the added advantage of being rustless.

There are many matters of which the shoemaker has to be aware in regard to leather. There is, for instance, the character of the soil of the district, which has different effects on different leathers. Leather which is suitable for city streets is unsuitable for the country, and vice versa. In mining districts, again, certain classes of leather are found to give longer service than others.

Individual peculiarities are numerous, too. Thus, some people wear their shoes only on one particular portion of the sole. This is usually due to their unconscious habit of giving a slight twist to their feet with every step. But generally it is on the outsides of the soles and heels where the majority of people wear down their shoes first. A number of artificial compositions are on the market which are helpful in prolonging wear on these parts of the soles, and especially on the heels of footwear.

Other factors, besides wear and tear, have to be considered. Flexibility is one of the most important. If there is any stiffness in the leather, it will react on the feet, causing discomfort and tiredness. The two most flexible types of footwear are the welted and the turned, the turned being those that are made inside out, then taken off the last and turned. The best kinds of both these classes of footwear are hand-made.

While the old adage, 'There's nothing like leather,' may still be echoed by successful tanners and manufacturers, as well as by satisfied investors, the shoemaker finds both a livelihood and a joy in handling a good piece of mellow leather in the course of his craft.

J. B. M.

A Prayer for Forgetfulness

O God, take memory,
Take memory,
This anguish
So poignant with misery,
Take all remembrance
Utterly away from me.

Is there no way,
No sharp and final way,
By which mind may gain
Ease in forgetting?
May I not shut,
Shut close the door
Through which these whispers come?
Murmurs of past so sweet,
So full of hope and tenderness,
That each one does but increase
What is beyond endurance.

Must it be borne,
This torture of memory?
May not some ease be gained?

O God, take memory,
Away unkind memory,
That I may know peace again.

PATRICIA HUMPHREY.

Diagnosis

EILEEN BARNARD

LIKE a home-made flag the tail of Sikeleti's shirt flapped behind him in the wind. It was carefully patched in purple satin, which gave it a somewhat frivolous air. But beneath it his legs were long and stringy, the legs of an old man, even if he was a warrior, and the son of a warrior in Dingaan's impi.

Over the veld and through the grasses to the mealie field he strode. The tasselled cobs had been stripped and stolen. He shook his knobkerrie angrily to the hills, where he could hear the hoarse bark of the baboons. Then he set off again along the path, grasshoppers whirring beneath his feet.

Down in the valley the women were laughing and shouting to each other as usual, wasting time with gossip as they filled their water-pots. But the river seemed to shrink more and more into the soft red soil where once it had been so deep it could drown a man.

As he came up the cattle-track to the wattle-and-daub mission hospital on the fringe of a plantation the wind died as suddenly as it had sprung up. The tail of Sikeleti's shirt drooped as he seated himself cross-legged on the ground beneath the feathered branches of the trees.

ACROSS the yard Sikeleti could hear the sing-song of the children's voices as they recited their multiplication-tables in the little church with its high tin roof.

There were mostly women waiting, women with the tall clay headdress of marriage, women and children. A child, barely a month old, cried and sobbed. '*Lala bebe lala*,' her mother sang, soothing it to sleep. The other women played with the pattern of beads on their skirts while they waited, laughing continually as they talked.

Sikeleti thought, looking at the baby: 'There is no child in my kraal. My wife is old now and sick. My daughters are wives and live in the kraals of their husbands—and my sons, ah, my sons, they are away at the mines.' It seemed to him the time would never come for them to return, for they had no money for lobela cattle, for the buying of wives. Prices were so high now. Umtetwa, the deadly foot-and-mouth disease, had killed their hopes. So they stayed on at the Rand, where it was said there were many wonders. But Sikeleti sighed as he looked again at the child.

It was then that the doctor man came towards him with the snake that listens hung about his throat, the long black snake that can even tell the secrets that lie in a man's heart.

SPEAKING in Zulu the doctor said: 'And where is the illness, old man, what is wrong?'

Sikeleti shuffled to his feet, and followed the pale tall Norwegian missionary into the cool thatch of the out-patient department. The shirt-tail flapped once more behind him.

'What is wrong?' the doctor repeated.

'It is my wife,' Sikeleti said solemnly. As he spoke, he could see her lying in the dark of the hut, lying there feverish and sick on the grass mat where he had left her, with another old woman beside her.

'But where is she? Bring her in from outside,' the doctor murmured, almost impatiently, moving toward the door of the room as if to call her.

Sikeleti stopped him. 'Ah, but she was too ill to come,' he said, shaking his head. Whereupon, from beneath the flapping shirt he produced a relic of Edwardian time, a prim blue and white spotted shirt waist,

the survival probably of some missionary trousseau. He held it aloft proudly, so the doctor could see, and the nurse too, see what a very fine garment his wife possessed. The only woman in all the valley who owned such a thing. Then, tapping the stethoscope gently, and fingering the faded silk of the blouse, in the most confident manner he thrust it into the startled doctor's hands. 'She was too ill to come, too sick. But I have brought her blouse for you to see, for you to listen with the snake, so you shall find out what is wrong with her, and make her well again.'

The Devil and Dr Fian

LEWIS SPENCE

DR JOHN FIAN, the preceptor of Prestonpans School, grim, lean, and not much over twenty, rode briskly along the dusty coastal highway. His dusky sallowness recalled the Gipsy, and in the slant of his long black eyes there was assuredly more than a hint of the East. Concerning his mysterious way of life general complaints were gathering and simmering throughout the district. Wherever he chanced to be, strange and unco things happened. If he gave a grudging supervision to his scholastic duties, it was abundantly plain to many that his thoughts were elsewhere than in the shabby schoolroom in the Lothian village in which his fate had been cast.

Some months before this Hallowe'en in October 1590, he had stumbled upon strange company. The lonely young man, separated by the nature of his circumstances from people of similar tastes to his own, and thrown back upon himself, nourished a keen, indeed an imperious, desire for forbidden knowledge. In the course of his infrequent visits to Edinburgh he had managed to acquire a small library of books relating to the black arts, and these he studied with such assiduity that Don Quixote was not more profoundly read in the intricacies of romance than he in the dark and unlawful profundities of Black Magic, Astrology, and the other occult sciences.

Worn out by the study of the volumes which so deeply intrigued him, the youthful dominie had betaken himself one evening to the seashore in search of relaxation, and had met with an experience unusual in his uneventful round. It was a snell evening in March, but careless of the biting easterly wind, he was plodding his way along the sands when he noted the form of a stranger who appeared to have sprung from nowhere. The man, tall, dark, and polished in manner, advanced towards him with rapid and purposeful steps, as if about to address him. Somewhat at a loss to account for the presence of so distinguished-looking a person at such a time and place, Dr Fian halted for a moment, the better to observe him, and saw that the unknown was making obvious signs that he desired to speak with him.

Elegantly dressed in sombre black, the tall and stately gentleman accosted him, sweeping off a broad-brimmed hat and addressing him by name. In courtly accents he expressed his pleasure at making the acquaintance of one so deeply versed in the wisdom of the sages as Dr Fian of Prestonpans. With natural ease, the stranger steered the conversation into those channels in which the youthful doctor's predilections lay. Fian felt himself in a seventh heaven of ecstasy. At last he had met with someone with whom he could discuss those subjects which lay so

near to his heart. For a couple of hours the twain paced the wind-swept sands, volubly discoursing on the profundities of Black Magic and the science of the stars, and, when finally they parted, it was with expressions of mutual esteem and assurances of a speedy reunion. The gentleman in black confided his name to his new friend, with the injunction, several times repeated, to divulge it to no one whatever.

This was the first of many such meetings on the lonely sands of Prestonpans, and with each succeeding interview Dr Fian felt more closely drawn to the gentleman in black, whose amazing erudition and gallant demeanour had won his entire devotion. Had the wretched young man foreseen to what a pass his fanatical zeal for hidden studies was to bring him, would he have faltered in his precipitous course, have struggled to break the mysterious bonds of attraction which fettered him to the man in black?

OVERWHELMED by the stranger's manner of the great world, as by his erudition in everything relating to the mysterious, Fian eagerly gave ear to his proposal that he should join a society devoted to the practical study and performance of Black Magic. This society, he was told, was composed of persons in all ranks of life, ladies of the Court, burgess dames from Edinburgh, and women of the people, with a sprinkling of men, both learned and simple. In such a cause rank mattered not at all. The prime business was the dissemination of the cult of magical knowledge throughout the land. So one memorable night Dr Fian found himself the central figure in a gathering of witches at a spot near Aitcheson's Haven, a fishing-village which then lay betwixt Prestonpans and Musselburgh.

It was in the black little woods adjacent to this spot that the doomed young man received the witches' mark, a blister on the shoulder which left a raised brown spot resembling a mole. One meeting of the witches' coven, or band, now followed fast upon another, usually at some remote place in the open air, sometimes in a peasant's cot. Fian was astonished at the heterogeneous nature of these assemblages. Governed by their 'Satan,' or Grand Master, the gentleman in black, whom Fian knew to be a nobleman of exalted rank, the band included such women of fashion as Mistress Euphemia Maclean, the daughter of Lord Cliftonhall, and Barbara Napier, sister-in-law to the Laird of Carschoggill. Less in degree was Agnes Sampson, known as 'the Grace Wife of Keith,' that is 'the Gracious Lady' of that district, a grave and reverend matron. Along with these, there assembled ribald persons considerably lower in the social scale, like Gelie Duncan, servant lass to an indweller in Tranent, and 'Auld Graymeal,' as he was called, a brainless ploughman, with a sprinkling of burgess folk from Leith and Musselburgh. But all these, high and low, were possessed by one common frenzy—the fanatical zeal of the witch-folk of that age for the destruction of the Christian faith and the establishment of the reign of Satan in the land.

So that this dreadful creed might receive a speedy impetus, the exalted miscreant who governed the witch covens in the area of Lothian had decreed that the reigning King of Scotland, James the Sixth, should be eliminated. The young King had recently sailed to Denmark to escort his newly-made bride, the Princess Anne, home to Holyrood, and was shortly to set sail for Scotland. This exceptional opportunity must not be lost. The vessel which bore the royal pair must be wrecked by means of sorcery. A great tempest must be raised so that the King's ship would be overwhelmed, and to this end magic of the most potent description must be resorted to.

Roused to a pitch of fanaticism by the eloquence of their 'Satan,' the three covens of the Lothian witches, thirty-nine folk in all, were given instructions from him to raise such a wind as had never before been experienced on the shores of the Firth of Forth. Working in concert, the witches of Edinburgh, Leith, Prestonpans, Musselburgh, and Tranent were ordered to capture a number of black cats, baptise them after the manner of their craft, and then cast them into the sea at one and the same time, the hour of midnight, by this means letting loose, as they fondly believed, all the winds that blow. Other magical means to effect the King's destruction were also to be employed. Fian and others of the company made their way aboard a foreign ship lying in the roads off Leith, and, after feasting on her decks, they scuttled the vessel, trusting, probably, to the power of sympathetic magic to bring a similar fate upon the royal caravel in which the King

and Queen were embarked upon their homeward voyage.

THE belief of the witches in the efficacy of their spells was heightened by the visitation of a storm of such violence as they could scarcely have hoped for. But, to make assurance doubly sure, a meeting of the band had been convened at North Berwick, so that the entrance to the Firth of Forth, through which the royal ship must pass, might also be subjected to equally severe weather. Accordingly, the greatest gathering of witches ever convened in Scotland gradually assembled at a point near the town an hour before midnight on the night of Hallowe'en in the year 1590. Those of higher rank were mounted upon hackneys, but others, to the number of at least a hundred folk, had made the journey on foot. The graveyard in front of the Church of North Berwick was teeming with women, for only six of the company were men, and these, with the half-insane Gelie Duncan at their head, began to foot it in a wild and wanton dance from one end of the enclosure to the other. Producing a Jew's harp, the servant lass drew from this rude instrument a harsh and discordant tune. The witches, great and small, followed her in single file in an abandoned frenzy, even the venerable Agnes Sampson capering and pirouetting in the leaping, screaming line along with Dr Fian and the rest. As they whirled and pranced, the witches chanted a popular song, the burden of which was:

Cummer gang ye before, cummer go ye,
Gif ye winna go before, cummer let me!

Their furious saltations at an end, the exhausted company then crowded to the door of the church. John Fian, by a juggler's trick, pretended to blow open the lock with his breath. Then, by a similar stratagem, he feigned to blow in the candles which surrounded the pulpit. No sooner were these alight than a man disguised in the trappings of Satan started up from its depths, attired in the traditional costume of the Adversary, and decked in all the insignia of infernal horror—masked with a fiend's face, crowned with snaky folds of hair and a goat's beard and horns, and dressed in a rusty and tattered black gown from which protruded a forked tail. He delivered a mock sermon, adjuring his flock not to hesitate in the commission of evil, and to eat, drink, and be merry among themselves while yet they were on earth.

Then with a loud and gusty voice he demanded that a cat be sought for and brought to him so that he might baptise it and cast it into the sea, an act which, it was believed, would precipitate such a tempest that the ship in which the King and Queen were making their homeward voyage would be overwhelmed by it. On hearing this, John Fian left the church in search of a cat, and soon conveniently discovered one lurking in the churchyard. But the creature proving exceedingly nimble, the schoolmaster levitated himself into the air by his magic art, flying hither and thither after the poor animal until at last he succeeded in cornering and catching her. Once secured, puss was duly given a name by the Devil and cast into the sea. Cats so 'baptised' for a magical purpose were usually given the name of some demon, or fiend, and it was thought that not only did the act bestow upon them the powers and qualities of such beings, but also that the spirit of the infernal genius after whom they were called actually entered into their bodies and was capable of wreaking such vengeance upon the victims of the witches as the latter chose to dictate.

'Satan' then called the roll of the members of the three covens present. But the witches began to murmur because a wax image of the King which had been made by Agnes Sampson and presented to the Devil at a former meeting at Prestonpans had not yet been made use of as promised. The intention was to place this image in front of a slow fire in order that it would melt and cause the King injury or death, a stratagem popular among the sorcerers of the time. But 'Satan' dissembled, assuring them that the image would be restored to them at the next meeting, as for some reason it was not yet ready for the purpose required.

Issuing from the church, the Devil, in whom Fian recognised the gentleman in black, then threw what appeared to be a globe, not unlike a football in shape, into the sea, upon which a dense fog spread across the firth, drifting eastward. The company then broke up and betook themselves homeward. The tempest which the witches believed they had raised continued to rage for some days, and it was afterwards learned that the ship on which the King and Queen had returned from Norway had experienced the most terrific gales, while

those vessels which had sailed in convoy with her had enjoyed comparatively fair weather.

THE rumour of these orgies was shortly noised about the district. Indeed, the hubbub made by the assemblage at North Berwick must certainly have awakened the curiosity of its townsfolk. Suspicion pointed to Gelie Duncan, whose activities among the folk of Tranent appear to have been that of a minor sorceress and spaewife. Her master, David Seaton, chanced to be a deputy bailie of the little town, and he straitly examined his handmaid. By the aid of torture he wrung a confession from her, in which she implicated Agnes Sampson, Dr Fian, and many others among the witch-company. The officers of the law were called in, and the leading members of the band were apprehended and taken to Edinburgh.

By this time, the King had returned to Holyrood, and, as an enthusiastic investigator of the practices of those devoted to the black arts, he became so deeply interested in the case that he actually gave orders that the chief actors in it should be brought to the palace, where he examined them in person before an admiring audience of the nobility. He first interrogated Agnes Sampson, who gave an uncompromising denial to all the charges brought against her. But when put to the torture, she confessed all. James particularly desired to hear the song played by Gelie Duncan to the witches, and the unhappy serving-wench was haled to Holyrood, where she performed the ribald ditty before His Majesty on her Jew's harp, to the delectation of the Court.

But the King had his doubts. He gave it as his opinion that the witches were all 'extreme liars' and that the whole affair was of the nature of an amateur effort on the part of eccentrics. Agnes Sampson, probably in that spirit of vanity which was so marked a characteristic of the witch sisterhood, vowed that he was mistaken, and by so doing brought doom upon herself and her companions. She took the King aside and solemnly declared to him the very words which had passed between him and his bride on their marriage night at Upsala. The King swore that her statement was sober truth, adding that he could not well have believed all the fiends of the air could have known what he had said to his Queen, and what she in her turn had replied to him on the particular occasion in question.

Yet Agnes, in her madness, acquainted James with still other proofs of her status as a sorceress, for she confessed that she had extracted the venom of a black toad and had done her utmost to procure from John Ker, one of the King's attendants, a piece of linen that had been worn by His Majesty, in which to soak this poison, an act which, she was convinced, would have brought about the King's death by sympathetic magic. John Ker, however, was a canny person and had refused to comply with her request, so that Agnes's vindictive efforts were in vain.

John Fian was then brought before James, and freely admitted that he had been 'clerk,' or register, to the witches. More he would not confess, so he was put to the severe torment of the boots. Even then he refused to speak, saying that 'his tongue would not serve him.' That member was searched, and at its roots were found two pins thrust up to the head, which, the witches declared, had prevented him from giving evidence. When these had been removed, he confessed his misdemeanours in full. Sent back to prison, he vowed repentance, but on the following day he told his jailers that Satan had visited him during the night. He had abjured the Fiend, and appeared to be greatly relieved in his mind. Yet on the night of that day he found means to escape and betook himself to Prestonpans. He was speedily recaptured and was once more brought before the King.

Put to still more exquisite tortures, he refused to divulge the manner in which he had effected his escape, and even the supreme torment of a more severe application of the boots did not wring his secret from him. He was condemned to be burned at the stake, and after being strangled, his remains were thrust into a great fire on the Castle Hill of Edinburgh, on one of the last days in January 1591.

INCIDENTS the most incredible were detailed in the evidence against Fian. It was said that he had attempted to lay spells upon a young lady of whom he was enamoured and that for days he had remained in his lodging at Prestonpans in a state of delirious frenzy induced by magical and diabolical dreams. One of his victims, it was said, was a gentleman who had paid court to the lady

in question, and this man was brought before the King in a condition approaching physical breakdown. But after a dreadful scene, during which he behaved like one possessed, he gradually came to himself and returned to normal conduct.

Euphemia Maclean was burned alive after due trial, and her estates were escheated to the Crown, although they were later partly restored to her children. Barbara Napier appears to have escaped on a trumped-up excuse, though one account states that she, too, was burned. Agnes Sampson tholed the fire along with many others of the rank and file. Her sorceries were too numerous to be excused, for, according to the evidence, she appears to have aided Lady Angus in enchanting her lord to his death. This Lady Angus, the widow of the Earl of that ilk, seems to have escaped trial only because she had taken as her third husband one Alexander Lindsay, Lord Spynie, a youthful favourite of King James, who had indeed warned him privily against the lady in a letter dispatched from Denmark and chiefly notable for the unbridled vulgarity of the expressions it contained.

The identity of the 'Satan' who governed the covens of the Lothian coast has been closely debated, but little doubt now exists that this part in the fatal drama was played by Francis, Earl of Bothwell, the cousin of King James, who, if the King had perished or had remained childless, would have been recognised as the legitimate heir to the throne of Scotland. This, indeed, seems wholly to explain the reason why he took so prominent a part in the conspiracy of the witches.

Bothwell was notoriously a practitioner in the black art, and was publicly rumoured to be so both in England and on the Continent. On two former occasions he had conspired against James. He was imprisoned and tried, but was acquitted, probably because of his nearness to the throne. Later, he once again rebelled against his royal relation. Collecting a rabble of rogues and free-lances in the Border country, he attacked the Palace of Holyrood with fire and sword, and almost succeeded in capturing James. But he and his rascally mercenaries were signally routed, and he was compelled to quit the country. For years he supported a somewhat wretched existence in Italy, where he continued to pursue the occult avocations which had betrayed him and had brought him such an evil repute.

This, the most dramatic incident in the chronicles of Scottish witchcraft, casts considerable light upon the nature and significance of that dark and vindictive cult. From the copious evidence respecting it, it is abundantly clear that the various means of sorcery employed by its agents were the relics of an extremely ancient species of folk-magic developed from barbarous times and primitive and savage custom. Associated with these beliefs, however, was the outline of a pseudo-religious system which probably dated from a much later period, and which mimicked or parodied the organisation and some of the offices of the Christian Church. In a word, witchcraft consisted of a pagan devil-worship, pre-Christian in its origin, but 'modernised' by the addition of that later species of Satanism which saw in the person of Lucifer, the fallen angel, the opponent of the Creator. Doubtless it made an appeal to scores of wretched women, the circumstances of whose dull and workaday lives made them the easy victims of a superstition which offered them excitement and a brief notoriety.

Resurgam

Already banked the slumbrous autumn fire,
And shrivelled, curling leaves, so crisp and dry,
Fall swiftly down, themselves a mounting pyre,
To hold the flame of life, and glorify:

To light again the daffodil's clear gleam,
Laburnum lanterns, buttercup's bright eye,
Shimmering bluebell's hidden misted dream,
And strengthen faith's sweet promise not to die.

ANNA BRETHERICK.

Books Afloat

The Seafarers' Education Service and the College of the Sea

JOHN MARSH

FROM a tall, prim house near the busy Euston Road, London, a dozen circulating-libraries are sent off every day in the year for use by British sailors all over the world. Annually 180,000 books, ranging from westerns and thrillers to the most abstruse psychological treatises, leave the premises of the Seafarers' Education Service (S.E.S.) for Merchant Navy ships using their library scheme.

This little-known, non-profit-making organisation maintains a supply of books to 1450 Merchant Navy ships, and is subsidised largely by the shipowners themselves. Though many books are donated direct by the public, the Service spends £8000 annually on new volumes, mostly fiction. The replacement rate is very heavy, as up to 50,000 books a year are required to take the place of those lost and worn out. Quite recently an appeal, published in the press and signed by Dr Ronald Hope, M.A., director of the Seafarers' Education Service, produced 14,000 bound books and over 20,000 paper-covered volumes and magazines. Queen Mary sent several books from her own private collection.

The Service was started in 1919 when a Blue Funnel vessel was supplied with a small library. Since then, 150 other shipowners have come into the scheme, and now almost every ship in the passenger and tanker fleets of the British Merchant Navy receives its books in this way.

THE libraries provided contain fiction and non-fiction in equal proportions. Westerns, thrillers, and light novels, including romances, are most popular, in that order. Seamen demand action in their reading matter and most of the non-fiction is made up of travel books and biographies. Favourite novelists are C. S. Forester, Somerset Maugham, Agatha Christie, and Peter Cheyney. If a seaman requires a particular book—whether it be fiction or non-fiction—the book is dispatched with the next consignment after notification has been given to H.Q. by the ship's librarian.

Aboard ship it is usual for the third mate or radio-officer to act as librarian, and on those officers' keenness depends the success of the Service. The books are generally kept in one of the ship's offices, and seamen can change their volumes at stated times. On the bigger ships there are often libraries in the officers' smokeroom and in the crew's recreation-room.

Ships can change their libraries every three months. When a vessel puts into a U.K. port the S.E.S. send the new library, packed in a wooden case, to the docks, and collect the old one. Ships on exceedingly long voyages may exchange their libraries with other ships at sea, provided they inform the S.E.S., so that the files giving details of the books can be listed under the right ship.

The house in Endsleigh Street, London, W.C.1, headquarters of the Seafarers' Education Service, is wonderfully organised for satisfying the reading wants of seamen everywhere. In one room new books are classified and numbered as received; in another they are sorted and put into libraries of various sizes for packing; the shelves of yet another are filled with special books to meet particular requests; and there is even an office where books, collected by the public and from other sources, and not fit-

ting the needs of the library, are set aside and classified for certain libraries, such as the British Museum, the Poetry Society, and so on. These specialist libraries, on receiving the volumes, either pay for them or send in exchange more popular works which can go into the general library-service for ships.

The filing system is purposely made very simple. This is done by filing 'libraries' rather than books. Thus, while any novel in circulation could not be quickly traced, it would be immediately known if a 'library,' returned by a ship, was short of any book sent out, because the filed cards would show what had been delivered to the ship three months before.

Out of a total income of £18,000, the Seafarers' Education Service receives annually £15,000 from shipowners and £1000 from the King George's Fund for Sailors. In 1948 the Service showed a loss of £265 on the year's working. It is a pity that such an excellent scheme as this should suffer for lack of support from the public, who rarely contribute more than £500 in a year.

AN offshoot of the Seafarers' Education Service is the College of the Sea, founded twelve years ago. In 1938 a radio-officer who wanted to learn Greek and Latin wrote to the Seafarers' Education Service and asked their advice. Instead of contenting themselves by forwarding him suitable books, the S.E.S. put him in touch with tutors who coached him in the languages he had chosen. So began a unique correspondence school, which in the last twelve years has given educational facilities to over 5000 seamen.

The most popular courses are mathematics, English, and foreign languages, though every subject from economics to short-story writing is covered. The College of the Sea can call on 1200 volunteer tutors to train these seamen pupils, many of them famous names in their particular subjects. For instance, Sir Harold Spencer Jones, F.R.S., H.M. Astronomer Royal, advises on astronomy and kindred subjects, and G. M. Trevelyan, O.M., C.B.E., Master of Trinity College, Cambridge, advises on history. Quite recently the College of the Sea received a request for a course on poultry-farming. It was impossible to deal with this in the usual way, but an appeal to the Ministry of Agriculture brought forth several books on the subject, which were sent to the seaman concerned. Other subjects about which enquiry has been made include clock- and watch-repairing, music, book-keeping, farming, photography, naval architecture, and geology.

This must be the cheapest correspondence school in the world. Once seafarers are put in touch with a tutor they are requested to pay a subscription of 15s. to help cover postage and administrative costs. There is no time-limit in the length of courses, which in every case is an individual matter between tutor and student.

The College of the Sea is in contact with local education authorities in all parts of the country, so that if a seaman is in need of educational facilities ashore these can always be arranged. The Ministry of Education has always been sympathetic towards the College's work, and, apart from supplying books at certain times, it regularly makes a gift of money towards administrative costs.

The Royal Society of Arts, acting in conjunction with the Seafarers' Education Service, allocates a sum of money annually to assist seamen under the age of twenty-three to rise in their profession, and to provide a number of scholarships which pay for the necessary books and for help by correspondence for four years from the School of Navigation, Southampton.

ONE invaluable work the Seafarers' Education Service and College of the Sea does is to give advice about the education of seafarers' children. Not long ago a seaman who had been abroad for many years and whose little girl had picked up but a scanty education approached the Service for help. Arrangements were made for the child to go to a local grammar-school, with special coaching, in a town near the home the seaman had taken. Another sailor's child, who had got out of hand because the father was away so much, was accepted by a boarding-school after certain negotiations between the S.E.S. and the local education officer. Another child, physically handicapped and with hardly any education, was accepted by a special institution after the S.E.S. had made the necessary representations.

An interesting feature of the work of the S.E.S. is the competitions it runs for all men serving in the British Merchant Navy. A

sum of £10 is offered for the best short story submitted each year, and a Challenge Cup and various money prizes are given for the best essays and poems. There are also photographic, model, and handicraft competitions with cash awards. The prize-winning short stories, essays, and poems appear in due course in the Service's magazine, *The Seafarer*.

Another Seaside Summer

JUNE SEVERN

I REMEMBER the last week-end of summer. Nothing out of the ordinary happened to single it out from its predecessors. Its only claim to notice lay in the fact that it was indeed the last, in an almost unbroken series of cloudless Saturdays and Sundays. The sky, as usual, was blue. So was the sea, sapphire to be exact, and the yacht ballet of red and white sails grouped and regrouped about the buoys, while screaming gulls dived across the purple shadows of the cliffs, and the heat shimmered over distant woods and stubble-fields. It was beautiful, but that hackneyed old saying about familiarity is horribly true, and to those of us who had been looking at the same scene since Whitsun it was beginning to appear rather too exotic, somewhat overdone, almost a little vulgar.

The one-man railway-halt behind the beach (one wooden shelter, one lamp-post, one rambler-rose), a station which only seems to rouse itself in holiday-time, was noisy with slamming doors and the whistle of escaping steam as excursion-trains disgorged their loads on to the wooden platform. Out they bundled —fathers, mothers, teenagers, toddlers, babies, dogs, carry-cots, perambulators, bicycles, primus stoves, beach-bags, picnic-baskets, and collapsible dinghies, and as the whistle blew, and each train chuffed its way up the long incline to the viaduct, a myriad-coloured human caterpillar wound its way down the narrow lane towards a beach which could scarcely accommodate one more family, while impatient motorists nosed a passage through the press towards an overflowing car-park, which smelled of petrol fumes, and sandwiches, and hot upholstery.

THAT was the last week-end of summer, and within seven days it had all gone—the gay swim-suits, the coolie hats, the young man who will take your photograph sitting on the back of a stuffed tiger, the Punch and Judy show, the naked brown children, nuzzling their way through enormous clouds of pink candy-floss, the bare-footed mothers, journeying precariously across the stones with laden beach-trays, having paid eighteen and sixpence deposit on the china. All that, and more, had been completely swept away, to join all the other golden carnival days in some mysterious land of limbo, leaving the seashore strangely enchanted, and subtly enchanting.

In the public gardens the drone of the miniature motor-boats was silenced for another season. One small boy sailed his toy yacht on the pond. A family of half-grown cygnets had the paddling-pool to themselves, while their parents, only partly over the moult, were busily grooming their feathers on the cricket-pitch. The air was full of a pungent smell of wet earth and fallen poplar-leaves. A red sports-car, with its hood up, was standing in the parking-ground, and inside three girls were uncomfortably huddled together, drinking Thermos tea. No ice-

cream, no popcorn, no postcards. A languid young woman, leaning over the half-door of the photographer's kiosk, was passing the time of day with the car-park attendant, who was wearing his wet-weather hat, and the deck-chairs were all drawn up in phalanxes under viridian-coloured Urban District Council tarpaulins.

Not that it was exactly a wet day. It was warm, and it was windy, and

All day up from the Channel clouds have been flowing,
Dove brown, dark with rain.

All the morning the sea had looked like a grey-chenille tablecloth, slightly tilted up at one corner, but, as high-water approached, it roughened a little, and the long rollers licked up the beach towards the blown sand, darkened and pitted by the last squally shower. There was still plenty of orange-peel mixed up with the sand, and a few ice-cream tubs, and one or two sodden chocolate-boxes and broken spades, but there was seaweed, too, wet and luminous, dark-red dulse, and translucent-green sea-lettuce, and bladder-wrack popping underfoot, and among the tangled masses of weed were iridescent top-shells, and mermaids' purses, and the first of winter's sad procession of dead sea-birds. Further along the beach two little girls, bundled up in macintoshes on top of their coats, and obviously suffering from clothes repression, were sullenly tossing a big striped ball to each other, while a boy in a new-for-the-autumn-term school-cap was flying a red and yellow box-kite.

YET in spite of this subdued and empty scene there still lingered some faint trace of summer glories. The time had scarcely arrived when those of us who are left behind after the last mad Saturday morning scramble back to Birmingham or Manchester, or Paddington or Pontypridd, come out in search of treasure-trove, cuttle-fish for the poultry, or seaweed for the garden, bits of cork for the soles of glamorous platform-sandals which we never get around to making, or pieces of wood which might come in useful, but which hardly ever do, because wood soaked in sea-water never really dries. Nor had the beachcombers reappeared, those mysterious gentlemen in tattered battledress, who suddenly arrive armed with spades and sieves, throw up huge mounds of sand like an army of outsize moles, and as suddenly disappear. It was neither summer, nor winter, nor yet autumn. We were suspended, as it were, in a timeless moment between the seasons. It was a moment both gentle and exhilarating, and at the same time tinged with a curiously delightful melancholy.

Along the cliff-path, and up on the headland, the camping sites were almost deserted. Dustbins stood like sentinels in a large ragged field, empty except for one green ridge-tent and one white bell-tent, and, further on, the last two parties of caravanners were moving out, leaving the permanent van-dwellers to enjoy more spacious surroundings, and from one cream-coloured trailer with blue plastic curtains came the smell of tea being brewed over a spirit-stove, bringing back memories of a hundred half-forgotten picnics.

The muddy track twisted down the slope between patches of russet bracken and emerald grass. Colour was everywhere, not the strident hues of high summer, but the rich, warm tones of old tapestry. The jagged pink and black rocks, up-ended against the deep-indigo water, were splashed with amber and saffron lichens. Young mottled gulls climbed and swung and dived, and climbed again, and little grey-brown birds flitted about among the faded rock-gardens of sea-thrift and pennywort.

There was nobody down in the cove, and the burnt-out hull of a boat, stranded high on the shingle, served to heighten the atmosphere of romantic gloom. So did the little Victorian pavilion, standing mouldering and desolate against a background of heavy trees, the big house, of which it was once part, sold up, its tiny rooms showing all the signs of recent army occupation. Gone were last week's bathers, the copper-coloured boys and girls, who sent showers of stones flying as they raced down the shelving beach, and gone were the blue and yellow canoes, the diving-raft, and the red sails of the innumerable rubber dinghies. Now one could only

hear the grating roar
Of pebbles which the waves draw back, and fling
At their return high up the strand,
Begin, and cease, and then again begin
With tremulous cadence slow, and bring
The eternal note of sadness in.

Gone, too, were the side-whiskered Victorian

gentlemen, and the lovely Tissot ladies, and the small children, wearing such an extraordinary amount of clothing, who came to the little thatched house, complete with servants and hampers, to picnic in the grand manner. From the woods above, a yellowing ash-leaf detached itself, and slowly spiralled down on to the broken balustrade, and in the dark avenues under the trees, where ferns cascaded to the very edge of the low cliff, the summer call of the wood-pigeon mingled with the winter song of the robin.

Back over the headland and across the sands the scattered groups of children were going home to tea. The tide was running out, leaving the sand wet and opalescent. A mongrel dog, out on his own, was chasing gulls. They rose complaining, settling each time a few yards further on, heads up wind, their cries echoing the harsh bray of the seaside donkeys from their winter-quarters the other side of the main road.

IT is a satisfying experience to go home from the darkling sands on a winter afternoon, home to the fire, and drawn curtains, and Sunday tea, leaving one little solitary black and white oyster-catcher puttering up and down an illimitable expanse of twilit shore. It is even more satisfying to linger over such a scene in the imagination, on an afternoon such as this, when in spite of an overcast sky the light will last for another two hours, and when it is still too warm to justify a fire. For when the time comes, that craving for the delights of winter, which I for one always experience when the summer is nearly done, has usually disappeared. Then come days of stinging spray and driving sleet, days when the fishing-boats must stay at home, when cockles lie dead in their hundreds on the beach, and dazed and starving little guillemots creep up the sands away from the swirling, angry sea.

Then how the weeks drag by, until we can hear the hammers ringing in the boat-sheds on the jetty, and watch the tarring of the lobster-pots, and snuff the smell of pitch and paint and linseed-oil. What æons of time must pass until once again the beach-attendant's terrier wipes himself lovingly in the wet green of newly-painted beach-huts, and the popcorn-seller takes down his shutters, and the station rose puts out delicate red leaves, and the first train deposits the first family on the platform, complete with dog, baby, carry-cot, primus stove, beach-bag, picnic-basket, and collapsible dinghy, and the first procession winds its way down to a beach swept and garnished for its reception, and we can look through the cherry-blossom at blue sea, red cliffs, white gulls, a scene no longer garish or vulgar, but more beautiful than we ever could have thought possible, and say once more: 'Another seaside summer has begun.'

The Barn

The barn is like a robbers' den,
With cobweb curtains grey and light,
And quiet noises now and then
Like robbers creeping out of sight;
The farthest corner from the door
Is filled with sacks tied up with string—
The more I look at them, the more
I think they might hold anything*!*

Against the other end a heap
Is spread of yellow-glinting grain—
Perhaps, when home the robbers creep,
It changes back to gold again;
But Farmer Giles and all his men
Can get in here with just a key—
Of course a real *robbers' den*
Would have an 'Open Sesame'!

ELIZABETH FLEMING.

Great Snakes!

GEORGE WOLFE

A NUMBER of years ago, while living in Bombay, I rode up by motor-cycle to Poona for the races. On my way back I broke down, but fortunately not far from the bungalow of a railway official with whom I had some slight acquaintance. Thus I had little hesitation in getting my cycle conveyed to his house for safe-keeping, intending to proceed back to Bombay as best I could, and send for it later.

Mr MacFarr was at home when I arrived, and with the true hospitality of the country insisted upon my staying the night, offering to drive me into town the next day should my bicycle not be repaired. This offer I gladly accepted.

My host, a bachelor, was entertaining a few friends for the week-end. There were no ladies amongst the party. As I had arrived about three o'clock in the afternoon I was invited to join in a game of tennis, suitable clothes being supplied. About six the light made further play impossible, so we settled in chairs to enjoy the cool of the evening, and chota pegs brought by the servants.

We had not been seated long when we saw a man approaching us from the direction of the main road. He turned out to be one of those wandering snake-charmers, complete with his basket of snakes and gourd-flute. Without being asked, he squatted down with the intention of going through his act. My host, however, who was an old resident of India, would have none of it, and told the man to be off.

The snake-charmer evidently realised that his ordinary performance was of little value or interest to the company, so, putting down his flute and closing up his snake-basket, he accosted my host and in Hindustani offered to conjure up snakes from the surroundings, should the Sahibs be disposed to see his powers. As there was nothing to do for half-an-hour or so, until it was time to bathe and dress for dinner, my host took charge of the man's basket, telling him to go and sit in the middle of the hard-court and produce as many snakes as he liked.

Without more ado the snake-charmer went where he was told and squatted down. Previously having recovered his flute, he commenced to play the usual slow rather high-pitched notes common to all his brethren, and presumably approved by snakes.

The light, as I said before, was not good, and, while we knew that there were always snakes about, we were extremely sceptical of the fellow's powers. Accordingly we paid little attention to him, being more interested in our conversation.

All at once my neighbour started and pointed, and, following the direction, I saw a largish green snake, evidently some form of grass-snake, gliding up over the bank towards the player. In a moment or two another appeared from the other end of the court, and so on at intervals from all directions, until there were eight or ten, the last two being smallish black cobras. The charmer, meanwhile continuing his playing, seemed entirely unaware of their approach. The snakes advanced very slowly, frequently raising their heads as if to listen from which direction the music came, and so it took them some little time to cross the court to where the player sat. When the nearest snake was about two yards from him, he suddenly altered his tune to what sounded like jarring discords. Instantly all the snakes took flight into the night.

Coming up to us, the charmer asked if we were satisfied. He was told to go to the butler for his fee.

THAT evening after dinner considerable discussion took place about the perform-

ance. Some said we had imagined the whole thing in the fading light; others held that the snakes had been planted beforehand. It was only my host who felt that the man really had some powers, musical or other, over the snakes. Before we broke up, it was decided to try and find the charmer and interrogate him further, and the servants were told to search for him and ask him to come to the bungalow the following morning.

In due course he turned up, obviously in hopes of further backsheesh. He swore that he had not planted the snakes, that his own were firmly tied up in the basket deposited at our feet, and, furthermore, he said we could take him anywhere we liked and he would find and catch a snake without his music.

As we were sufficiently interested, arrangements were made for the man to present himself the following Sunday morning, and I was lucky enough to be asked to see the show.

On the day appointed I and two other of the guests duly arrived at our host's bungalow, the remainder of the party being unable to come. Rather against our expectations, the charmer was punctuality itself, and, our host driving, we all packed into his rather ancient but commodious car.

We drove five or six miles back on the main road towards Poona and then turned on to what was little better than a cart-track. The country was bare and entirely deserted except for a few vultures in the distance feeding off some carrion. After about a couple of miles my host pulled in to the side and we all got out. For half-a-mile around there did not appear to be hiding-space for a golf-ball, let alone a snake. There was nothing but hard flat earth, with a few stones here and there. Our charmer, however, did not seem a bit perturbed and, on being told to get on with the job, stood rigid for a few minutes, whistling very softly the while. Then suddenly he set off at an angle, walking sharply for about thirty yards, when he again stopped for a few minutes. This performance he repeated three times, but his general direction was always the same. All at once he darted forward, pushed aside a small stone, thrust his hand into a hollow that had been partly hidden by it, and jerked out a three-foot-six cobra by its tail, throwing the beast about twenty feet from himself. Before the astonished snake had time to recover itself and make off, the charmer, who had wrapped a large handkerchief around his left hand, dashed at it and thrust his bandaged hand in its face. This, of course, was too much for the cobra, which instantly raised itself and struck at the hand. As quickly as light the charmer seized the reptile behind the neck with his left hand. The cobra, its fangs hopelessly entangled in the material, was then bundled up in the rest of the folds, and secured so that it could not escape. This done, the charmer returned to us, smiling all over with satisfaction, and explaining that later he would draw the fangs and add the snake to his collection.

We returned to the bungalow in a contemplative mood.

Now, in the first instance, there is nothing mysterious if you are prepared to accept the fact that snakes are attracted by a certain form of music, but, in the second instance, the snake had been found and caught by the 'tail,' therefore it had not been attracted by the whistling, or it would have turned about to come and find out what it was all about. The man could not possibly have visited the spot before and planted the snake, since he had not the vaguest idea where we were going, nor had he a snake on him, as my host had taken the precaution of having him searched.

SOME years later I was on a rubber estate near Kuala Lumpur, and one of the assistants became slightly mental—in fact the poor fellow eventually had to be sent home. We will call him Smith. He would go out from time to time and spend hours sitting on a fallen tree in the middle of a new clearing—an area of jungle just felled and burnt off and being prepared for planting.

On one occasion I went off to find Smith, as the doctor had strictly forbidden the practice I have mentioned. On nearing the clearing through the rubber-trees, I heard a faint low whistling, and shortly after I saw Smith sitting on the stump of a felled tree in the full blaze of the sun. He was absolutely motionless, and was whistling or humming to himself. As I watched him, I noted something move on his leg, then something else seemed to jerk forward slightly on his shoulder. I advanced as quietly as I could, and to my astonishment perceived that there were more than a dozen lizards on or about him. Before my very eyes one came from under a near-by log and approached Smith in short, sharp runs. Just then I made a noise, which he heard, as

did also the lizards, who were off in a flash at his first movement.

I questioned Smith, but all I could get out of him was that he could always lure lizards, but had never been able to interest a snake. I tried to get him to teach me the tune he whistled, but he resolutely refused. Shortly after, as I have said, the poor fellow was sent home. I do not know whether it was his mania which gave him the right intonation, for I am sure that there is a certain combination of notes or sounds to which snakes and lizards are susceptible, and it would appear that the combination for snakes is different from that for lizards. Thus, the charmer produced no lizards, though there were plenty about, and Smith produced no snakes, though again there were plenty about.

The Farthest Planets

W. H. SALMON, M.A., B.Sc.

IN ancient times the limit of the solar system was marked by the planet Saturn. There were seven planets and no more—the Sun, the Moon, Mercury, Venus, Mars, Jupiter, and Saturn—all revolving about the Earth, then regarded as the fixed centre of the physical universe. Any suggestion that there was a planet beyond Saturn was looked upon as a rank scientific and theological heresy. Seven was a sacred number. Were there not seven days in the week? Were there not seven openings in the head—two eyes, two ears, two nostrils, and the mouth? Was not the world created in seven days? In the mediæval cosmogony, for example in Dante's *Paradiso*, there were seven heavens—an idea preserved in our modern expression 'the seventh heaven of delight'; there were seven hells in his *Inferno*. In olden days sacrificial ritual blood was sprinkled seven times and a solemn command was often emphasised by the injunction: 'Do it unto seven times.' These arguments were regarded as unanswerable. Nor are they quite so absurd as seems to us at first sight. The ancient philosopher, equally with the modern scientist, sought order in the physical universe—the former by the study of number, the latter by the observation of the external world.

However, this neat, rigid system of the universe was destined to be rudely shattered—first, by the announcement of Copernicus in 1507 that the Earth revolved about the Sun, so that the Sun and Moon could no longer be regarded as planets; secondly, by the discovery of another planet by Herschel in 1781.

Frederick William Herschel, generally known as Sir William Herschel, was born at Hanover in 1738. He was the son of a musician in the Hanoverian guard, and in 1757 he came to England to earn his living by music. He secured work as organist in Bath, and became the leading musical authority there. He devoted his leisure hours to the study of astronomy and the construction of telescopes. In this he was ably assisted by his sister Caroline who joined him in 1772. The brother would often spend the whole of a winter's night at the telescope, describing what he saw to his sister sitting by, who transcribed those observations till the ink sometimes froze on her pen. For nearly fifty years the brother and sister worked together in this way. Caroline was herself a competent observer, and in her spare moments swept the sky with a small telescope, and detected three nebulæ and eight comets. For her valuable work she received the gold medal of the Royal Astronomical Society in 1828.

On 13th March 1781 Herschel was examining the constellation of Gemini when he saw a small object which had a measurable diameter, and therefore could not be a fixed star. He did not dream that there could be a planet additional to the ones which had been known for thousands of years, so he thought the body must be a comet. He kept it under observation for several weeks, and from his observations the mathematicians computed the body's orbit, and pronounced it to be a real planet. It had been seen before by many astronomers, notably by Flamsteed, the first Astronomer Royal, in 1690, but the observers had never suspected that the body was a planet. The discovery that it was, aroused intense excitement in the astronomical world. Herschel named the new planet 'Georgium Sidus,' in honour of King George III, who knighted him and made him his private astronomer. On the Continent the planet was generally called Herschel; but Bode, director of Berlin Observatory, who formulated Bode's Law, connecting the serial order of the planets with their distances from the Sun, named it Uranus. In classical mythology Uranus (Heaven) was the husband of Gæa (Earth), and the father of Saturn.

Under favourable conditions the planet is just visible to the naked eye. Its day is 11 hours long, and it takes 84 of our years to revolve around the Sun. It is so cold that the ammonia is frozen out of the atmosphere, which consists mainly of marsh-gas. The most remarkable feature of the planet is that the plane of its equator is inclined at 98° to the plane of its orbit round the Sun. It therefore rotates in a retrograde direction—that is, in a direction the reverse of that of all the other planets. On Uranus, consequently, the Sun rises in the west and sets in the east, and at certain seasons of the year the north pole is the warmest place on the planet. Uranus has five satellites, which share the retrograde motion of the planet. Two of these were found by Sir William Herschel in 1787; two others by Lassell in 1851. The fifth, named Miranda, was discovered in 1948 by Kuiper at the McDonald Observatory in Texas with its 82-inch telescope, the third largest telescope in the world.

Herschel was also known for his valuable observations of 'double stars,' and for his memorable paper showing that the solar system was travelling towards a point in the constellation of Hercules. He died at Slough on 25th August 1822. His work was ably carried on by his only son Sir John Herschel, who was educated at Eton and at St John's College, Cambridge, where he graduated as senior wrangler in 1813. Besides completing his father's work on the orbits of revolving double stars, he made catalogues and charts of the nebulæ and star-clusters in both the northern and southern hemispheres. He was also an accomplished chemist. Quite independently of Fox Talbot, he invented the process of photography. For five years he was Master of the Mint, a post Sir Isaac Newton had held a century and a half before. He died in 1871, and his remains were interred in Westminster Abbey close to the grave of Sir Isaac Newton.

THE next planet to be found was Neptune. This was the second heavenly body to be detected before it was actually seen, the first being the companion of Sirius. A Cambridge mathematician, John Couch Adams, who had graduated senior wrangler in 1843, and a Frenchman, U. J. J. Leverrier, share the honour of making this discovery. Some time after the discovery of Uranus in 1781, the French astronomer Bouvard resolved to determine the planet's path and to construct tables of its motion. He took account of the perturbations in the motion of Uranus caused by the other planets, but he found that, even with this allowance, the earliest observations could not be reconciled with the more recent ones. Assuming the later observations to be more accurate, he rejected the earlier ones, and constructed tables of the motion of Uranus, which he published in 1821. He fully realised, however, that the discrepancies might be due, not to inaccuracy in the early observations, but to an external and as yet unrevealed cause. He said: 'I leave to the future the task of discovering whether the difficulty of reconciling the two systems is connected with the ancient observations, or whether it depends upon some foreign and unperceived cause, which may have been acting upon the planet.'

The position of Uranus, as calculated from Bouvard's tables, soon began to differ again from the observed positions, and these differences increased as time went on. It began to be suspected that the erratic movements of the planet were caused by a distant unknown disturbing body, possibly another

planet. This attracted the attention of Adams, who was the first to calculate at what point in the sky search should be made for an outside planet which could cause the observed irregularities. This point was actually within two degrees of the position at that time of the unknown planet; and a careful telescopic search in that neighbourhood would have led at once to the discovery of Neptune. It was in September 1845 that Adams, then aged 26, presented his calculations to Airy, the Astronomer Royal. Unfortunately, Airy was dilatory in the matter, and it was not until July 1846 that he urged Challis, the Professor of Astronomy at Cambridge, to make a search at Cambridge Observatory, where there was a telescope larger than any at Greenwich. Challis began his observations on 29th July 1846, and actually saw the planet twice, on the 4th and the 12th of August. But he did not recognise it, as he delayed the comparison of his observations on the two nights.

Meanwhile the French astronomer Leverrier was also investigating the theory of Uranus. By June 1846 he obtained a position for the planet differing by only one degree from that of Adams. Leverrier's results were sent to Berlin Observatory in September 1846 and the planet was discovered as a star of the eighth magnitude a few days afterwards. The new planet was named after Neptune, a brother of Jupiter, who ruled the sea, and is usually represented holding a trident.

Neptune has a day 16 hours long, and it takes 165 of our years to complete its revolution round the Sun. It has a diameter of 33,000 miles; it is not much denser than water, so that the planet has only seventeen times the mass of the Earth. It is extremely cold, and its atmosphere consists of marsh-gas. It is too far off to be seen with the naked eye. Neptune has two satellites. One is distant 220,000 miles from its primary. This has a diameter of 3000 miles, and revolves in a retrograde direction round the planet. It was named Triton. In Greek mythology, Triton was a merman, having a body of which the upper part was human and the lower part like a fish. He was generally represented blowing a twisted horn in the form of a conch or sea-shell. He was supposed to be the son of Neptune, and to be able to calm or raise the waves by blowing his horn. In one account of the Great Deluge, when it was decided that Deucalion, the Greek Noah, and his wife Pyrrha were undeserving of punishment and should be saved, Neptune sent Triton to blow his horn. In response to this blast the sea returned to its normal position. The memory of Triton is preserved in the phrase 'Triton of (not strictly "among") the minnows'—that is, a person far out-topping his fellows, a quotation from Shakespeare's *Coriolanus*. A second satellite was found as recently as 1st May 1949 by Kuiper, in Texas. It is of magnitude 19, and has a period of 24 years.

THE sensational discovery of the existence of the planet Neptune, by means of the perturbations it exercised on the next interior planet, namely Uranus, naturally suggested that there might possibly be even another planet beyond Neptune, perturbing Neptune, even as Neptune perturbed Uranus. In order to carry out this research, it would be necessary to examine the orbit of Neptune and to see how far, if at all, it deviated from its regular and computed course. This accordingly was done, when sufficient observations of the planet had been made to be able to calculate its path. It was found that there were discrepancies in the motion of both Neptune and Uranus. Lowell and Pickering worked on these as the basis of their research, and on 13th March 1930 the new planet was discovered by C. M. Tombaugh of the Lowell Observatory, Arizona, in the constellation of Gemini. It was named Pluto, after the god who ruled the underworld, the supposed gloomy abode of the spirits of the dead.

Pluto is a faint object of stellar magnitude 15, and of a decidedly yellow colour. It is one of the smaller planets, not much larger than Mars; and its mass is about one-fifth of that of the Earth. It has the most eccentric orbit of all the major planets; and its distance from the Sun varies from 4580 million miles to 2760 million miles. At this latter distance, Pluto actually comes within the orbit of Neptune; but the two planets are never in danger of colliding, because of the large inclination of their orbits. They never come nearer to each other than 240 million miles. Pluto's year is two hundred and fifty times as long as ours. It is extremely cold, its average temperature being about 380° below zero Fahrenheit. There are a few authorities who consider that Pluto may not be a major planet after all, but simply an asteroid with an abnormal orbit.

Three Warnings

THOMAS KELLY

MORE than once I heard my father say there were two kinds of men he had no patience with. One was the lad who spent his life going to foreign places—he didn't mind whether he went as a stoker on board ship or as an explorer after diamonds—and had nothing to show at the end of it but a pair of empty hands. The other was the boy who squandered his inheritance, be it great or little.

When he mentioned the second class I knew he was having a cut at my uncle, because he was the bad boy in our family. My mother used to put in then: 'He 's his own biggest enemy, but poor Dan's heart is in the right place.'

Whenever she made that excuse my father always remarked: 'Then it 's a pity his head isn't.' So you may guess whose brother uncle Dan was.

I was supposed to be saved from following in my uncle's footsteps, because I lost my inheritance before it came to me. He had stood sponsor for me, and at the christening party had announced that, when he went, everything he left would go to the shrimp in the cradle. But he drank one field after another until every acre he owned had slipped through his fingers.

At that time he had a comfortable little farm, left to him by his father, at the back of the hill beyond the river. But he had an uncomfortable thirst, so he used to spend most wet days, and some fine ones, in Barney Joyce's pub. Barney was what some people called a gombeen-man. There were others who chose to style him a grabber, while according to my father he was a trapper. As well as the shop at the crossroads, the publican owned a good deal of land, some of which he had laid his hands on by a method of his own.

FROM my father I heard that uncle Dan's downfall began the year after I was born. He went to order bag-manure and seed-oats for the spring sowing to Barney Joyce's shop. As he had no cattle, or sheep, or wool to sell just then, he asked Barney to mark the amount down in the book, saying he hadn't the dry money with him.

'Arrah, what worry is on you about paying, Dan?' the shopkeeper smiled at him. 'Isn't your word as good as your bond? Isn't your name eighteen carat for ten times the amount? Sure it 's no great compliment at all.'

My uncle was so pleased with what my father afterwards described as the bait in the trap that he ordered drinks for every customer in the shop. They were mostly men back from England, all lamenting how bad things were over there; or men waiting to go to England, and complaining that there was nothing for a man in this country. After a pint or two they were saying, loud enough for him to hear, what a decent man uncle Dan was. The publican went on filling up large tumblers and jotting down figures that he put later on in the big black book he kept in the little cubicle behind the counter, near the front window.

When the harvest came, uncle Dan sold three cattle at the September fair. On his way home he called into the crossroads shop to settle up. It took the two bullocks and the best part of the heifer to square up what he owed Barney Joyce. He was so surprised at having so small a sum left over that he asked the publican to start again entering the next amounts in the book. But he told himself then that they 'd be much smaller in future.

Still, by the following spring the debt against him was so high that, when he ordered the guano and the seeds and suchlike for the next season, the shopkeeper stroked his chin in

thought: 'Um, I see.' For a while Barney stood humming and hawing, but at last he smiled as if his good nature just managed to win over his fears: 'Ah, sure I suppose it 'll be all right, Dan. You have a snug little holding, so your credit is as good as the next man's.'

When he announced that, my uncle again remarked that it was a bit of a shock to him to hear the sum he owed already, so Barney invited him to come behind the counter and have a squint at the book for himself. 'It 's all there in black and white, Dan,' he explained. 'Entered in chronological order, chapter and verse, day and date, as per government regulations.'

At that my uncle pointed out that of course he wasn't doubting the shopkeeper's word—just that it was a sort of a surprise, like, to hear that the little indebtments could mount up to such an eye-opener of a total. ' No arguing with what 's in the daybook and the ledger,' returned Barney, as if the matter pained him as much as it did my uncle. 'Mind you, I 'm not saying you 're one of them, Dan, but there 's a share of people never thinks that the poor retailer has to pay through the nose, and on the nail, for every little consignment of goods he gets from the wholesaler and the manufacturer. They 're the tough boyos to deal with, I can tell you. Haggling over the one per cent discount I 'm allowed for cash. A mean little shilling in every five pounds, Dan. Not much profit in that!'

My uncle stated that indeed he knew that Barney made very little profit, and that he was very decent about giving credit. Then Barney himself held he wasn't an unreasonable man, and that he did try to oblige whenever he could. He even asked my uncle if he was sure he 'd ordered enough spring stuff, as 'twould be no use coming again near the end of the sowing-time, when stocks might be exhausted.

ABOUT a month later my uncle was in the bar one day, when Barney whispered he 'd like a word with him on a personal matter. They went out of hearing of the people in the shop before the publican coughed and began: 'I 've been thinking over things, Dan, because of how I 'll be placed shortly. It 's this way. You can oblige me, and at the same time pare off a bit of what 's charged up to you in the books. I 'll be terrible hard pushed for grass this summer, and you have a couple of good grazing-fields along the river. So, on May Day, what about me sending a couple of young cattle to graze on your place? It won't hurt you, and 'twill be a great obligement to me.'

On the first of May the shopkeeper sent two big horned-cattle, that looked as lanky as a pair of greyhounds, to graze in my uncle's fields. He kept coming in his pony-trap on Sunday evenings to see how they were filling out, and to remind my uncle not to overstock the ground, because that wouldn't be fair to the dumb beasts.

Next year Barney sent four head of cattle, and the year afterwards he had the grazing of six, as well as a crop of turnips planted in one of uncle Dan's two tillage-fields.

My uncle began to look shabbier and shabbier. It wasn't long until Barney Joyce was allowing him to graze only a cow and a few sheep in his own fields. And two or three years later, the gombeen-man suggested that the least troublesome thing would be for uncle Dan to transfer the farm to him—lock, stock, and barrel.

Only then did uncle Dan tell my father how bad things were with him. My father often advised people about right of way, trespass, going to court, and things like that. When he heard my uncle's story he said that a publican couldn't afterwards sue a man for drink supplied for consumption on the premises without payment at the time. 'Tell him what I 've told you,' my father finished. 'Let him see you know a little about the law, then watch him smile on the other side of his foxy face.'

But Barney Joyce only smiled on the right side of his face after he 'd listened to what my uncle told him. 'Arrah, what intoxicating liquor are you talking about, Dan?' he asked, as surprised-looking as a child whose mother has slapped it for the first time. 'Sure I wouldn't give one of my own relations as much as a pint of porther on credit if I thought he was going to do the clever fellow on me and renage the debt after. Aye, even if 'twas only the tuppence for one pint. Sure any little refreshment you had under my roof, Dan, whenever you didn't happen to have the ready money on you, was always on the house. 'Tis many's the time I do the likes for a regular customer that finds himself a bit short.'

My uncle kept asking how could the debt against him be so big, after all the grazing and tillage Barney had from him, without paying a

penny piece for that same. 'Because of goods and merchandise supplied, Dan,' the publican explained very patiently. 'The bit of grazing and so forth were duly credited to your account at current rates, but the balance remains for settlement. As you have doubted my word, I must insist on your coming and having a squint at the books for yourself. Though, I 'm glad to be able to make the proud boast, you 're the first customer that ever saw fit to doubt my word. And I shouldn't have to tell you of all people, Dan, that I didn't start to oblige me customers the day before yesterday.'

MY uncle stepped behind the counter and along to the cubicle while Barney went on explaining: 'The said merchandise included timber and hardware, artificial manures and fertilisers, provisions and groceries, yellow meal, bran and pollard, besides other miscellaneous items too numerous to mention offhand.'

'Glory be!' my uncle gasped. 'Sure I never had half them commodities.'

'They say most people have short memories for what they 're obliged with,' Barney nodded, as he reached up to the shelf for the black books. He thumbed the edges of one of them, then opened a page. 'Here we are, Dan, your ledger account. We 'll take an item at random. Any of them you like to select. Say this one? February the twentieth: To goods, three pounds seven shillings and elevenpence, net. Page in daybook, two six nine. We 'll turn up the daybook entry and check up particulars of the goods. Here we are, February twentieth. Daniel Dermody, Lishnadreelogue. No doubting your identity, I suppose? There 's the history of that transaction—goods supplied, and recorded on same day, as per the legal requirement.'

My uncle gaped when he saw the first debit on the list: 'One barrel, Champion seed-potatoes, Special.'

'A barrel?' he said, hardly able to believe his own eyesight. 'Half-a-ton? I never ordered that much. I ordered sixteen stone. Sure I only planted that strip in the field where you had the spring wheat. I remember it as well as yesterday.'

'I don't think I claimed that you ordered them personally, Dan. Can you remember who was your duly accredited messenger at the time?'

'Of course I can, Barney, for it 's not so long ago, and I don't often employ help these times. I sent Festy Finneran. The lad was working for me in the spring. You remember he went to New York early in the summer?'

'I 'm well aware of that fact, Dan,' the publican admitted solemnly. 'And, judging from a few things I heard about that bucko since he left, 'twill be a long time before he comes back. I was terrible disappointed in the disclosures about him since he left. Still, the painful truth for you is that at the time he ordered the goods on your behalf he was acting within the course of his employment as your servant. How was I to know the lad wasn't straight? Mightn't you have considered it an insult to your credit if I declined to supply him when he said the stuff was for you? Look, I 've noted the relevant fact in the daybook. There it is at the top of the page: "Per Festus Finneran." And that 's been checked by the auditors.'

'You mean that—that Festy did the dirty turn on me?' asked my uncle open-mouthed. 'It 's—it 's daylight robbery.'

'If 'twas one item only, Dan, it wouldn't be so bad, but once a young lad goes crooked he keeps crooked.' The shopkeeper was looking at something on the ceiling as he went on: 'I often advise customers like yourself, Dan, to make it a rule—personal or written orders every time. Otherwise, what safeguard have they against a deceitful messenger? Better still, a passbook, which same I 'm always willing to supply on request.'

My uncle was very crestfallen when he came to our house to tell the result of the interview. But my father wasn't very surprised when he heard the account that Barney Joyce had given. 'Just so, just so,' he nodded. 'It 's about what I 'd have expected. The gombeen-man relies on his book, so he makes sure to put enough in it. "Come into me parlour," he says under his breath when he 's taped the suitable mug, "but when I get you there I 'll nail you!" Barney Joyce got hold of three nice little farms—with a fourth on the way—since he settled down at the crossroads. He can send his upstart sons to boarding-schools. That 's powerful going for a man who started from nothing, only twenty years ago, in a little huckster's shop?'

Whenever my father told me of uncle Dan's dealings with Barney, he always finished: 'Let that be a warning to you, me boy, when you grow up. Never have any truck with the

gombeen-man. When he gets you deep enough in his books he 'll read you the riot act.'

WHEN uncle Dan lost his land he came to live with us. For a while he did jobs around our place, but after a few weeks he went away. I knew that he used to work in some far-off town, for he was handy with timber and house-repairs. But he wouldn't bring disgrace on us by working as a handyman for people near. He came to us for his holidays, very long holidays sometimes.

I often heard my mother telling the other women who turned up to talk and drink tea with her how my uncle was so unlucky as to come down in the world. But there was never a mention of the gombeen-man in her account of his downfall.

'If only he hadn't spoiled the fine match I introduced for him,' she lamented one day, 'he might be a snug farmer now. Every penny of two hundred pounds Amelia Durkin had as her fortune, because her brother got that sum with the girl he brought into the place. A sensible wife, too, Amelia 'd have made him, for she was never the one for tight waists, high heels, or fal-lals. A great hand with the butter and the baking, and the luckiest you 'd meet in a day's walk to rear turkeys and chickens. Well, the match was agreed, and everything ready to be signed, when Dan went and upset the whole arrangements. Said the foolish words that ruined his life for ever after. No decent girl could very well look his side of the road after that. A fine dowry as good as thrown into the fire.

'It happened on the fair day of Clonbrooney. Dan was to meet Amelia in the best hotel in the town when the fair was over. 'Twas to be the formality engagement that day, so he was to bring the measurement-card from the jeweller's to the hotel, then go back and buy the ring. Everyone knows it isn't lucky for the girl to try on the engagement-ring beforehand, that 's why they have measurement-cards.

'Of course Dan should have been waiting in the hotel when Amelia and her brother arrived, but he wasn't. So the two of them started off to look for him through the town. And where do you think they found him? In what they call a saloon-bar, drinking with his foolish friends. He 'd got a stiff price for his cattle earlier on, and maybe he 'd have been luckier if he hadn't. He mightn't have been so up in himself.

'Amelia was the first to see him, sitting in the middle of the thirsty crowd of soakers that was helping him to drink his share. Naturally, the girl was scandalised to be treated like that. Small blame to her in one way for walking in beside the tipplers and saying: "So it 's here I find you, Daniel, in a drinking den."

'With the foolish pride some men have, Dan didn't like being reminded in this fashion of what should have been a happy day for him. Or maybe the fumes of the whisky-punch had made him a bit light-headed, so he was confused at being called Daniel in a den. Whatever came over him, he twisted round to Amelia and roared: "Be off out o' this, you old rap! You and your drinking den, libelling a respectable bar. You 're starting fine and early, aren't you, with the bossing? Well, you started a day too soon."

'The outraged girl just turned on her heel without a word. Calling her old, and she still on the sunny side of forty! Inside the month she 'd made a fine match, with a big farmer back in Ardsoolin, and is doing great ever since. She 'd have been the makings of my brother, for he 's the kind that needs a woman's guiding hand to keep him steady, only he hadn't the sense to know it. Signs on him, he went down the hill from that day forth, he that should be holding his head high to-day.'

Whenever my mother knew that I was listening to her account, she 'd say to me afterwards: 'Take heed of your uncle Dan's misfortune, boy. Give the public-house a wide berth when you 're a grown man.'

I didn't know at that time that a match in which a woman has any part never turns out luckily, but, even if I 'd been able to tell my mother that, she 'd have laughed at me. She believed only the superstitions that suited her.

NOW, you 'll hardly think it possible that uncle Dan could ever have been in a position to point to somebody else and say to me: 'Let that be a warning for you!'

I was still a slim youngster on the summer evening he said to my mother: 'I think I 'll go for a bit of a stroll, and take the shrimp with me.'

'You won't keep him out late?' she asked quickly. 'You won't go . . .?'

'Is it me to go drinking?' my uncle inter-

rupted her. 'Now, what put such a thought as that into your head?' He looked as wide-eyed then as a country boy seeing a conjuring trick for the first time.

'It 's just that I wouldn't like the boy to be out much after dark,' she explained. 'Still, if *he* is with you, it isn't likely you 'll fall into bad company.'

Uncle Dan took my hand and we went up the back road behind the village, along the river, and across by the lake. It was beginning to get dark as we came down the bog-road towards home. We were nearly there when we met Weasel Garavan. He was a thin little man with a brown moustache that curved round his upper lip and into his mouth, a chin that finished before it had properly started, and a pair of shifty eyes. He said to my uncle: 'You 're coming up, of course? I 'm on my way there now.'

'Up where?' my uncle wondered aloud.

'To Larry Joe's. Where else? Peter's Ned is getting married in the morning, so we 're having a bit of a stand-round to-night.'

'Peter's Ned's father was a decent man,' said my uncle. 'Ye won't be making a late night of it?'

'What late?' the Weasel asked innocently. 'Won't Larry Joe fling us out on the stroke of ten?'

'It 's on account of the shrimp here,' uncle Dan put in. 'If I took him home first, I couldn't very well come out again.'

'The boy 'll come to no harm, Dan. No bad language. Maybe 'twill be an edification for him.'

'On your promise to leave early, I won't let Peter's Ned down,' my uncle said as we turned back with the Weasel.

There was a crowd of men in Larry Joe's snug, talking loudly and drinking pints of porter. A few of them were teasing Peter's Ned, advising him how a newly-married wife should be treated. He was a tall, serious-looking man, greying somewhat at the temples, who wore his hat rakishly on the side of his head.

Someone ordered pints for Weasel Garavan and my uncle, and a bottle of lemonade for me. The gas from it went up my nostrils, and gave me a heady feeling. I didn't understand most of the talk around me, but near closing-time a man they called Charlie thumped the table and called: 'Ah, ye 're all talking nonsense. I 'll give you the best tip of all, Ned. When you 're left alone in the house with her to-morrow night, give her a clip across the ear. That 'll show her who rules the roost.'

There was a bellow of rough laughter then, but Peter's Ned persisted quietly, for he didn't seem to know the others were joking: 'Ah no, lads, I 'm getting a quiet one, thank goodness. I knew her mother well, a kindly woman. No rough house. A peaceful start, that 's the wise way.'

'A start like the boy at my elbow made?' the man who sat next to Weasel Garavan suggested.

There was another gust of laughter at that, and I knew they were picking at the Weasel. 'Whass that, whass that?' he asked thickly, for he had been making up for lost time since he came in, having drunk two extra pints belonging to men who said they were full right up.

'Nothing, nothing to notice,' my uncle calmed him, but the Weasel's beady eyes kept darting at the one at his side who had spoken.

'Then, I 'll agree with the second-last speaker,' he announced. 'Nothing like landing her a good clout, early on, just to announce who 's lord and master.'

They all laughed outright, as if the Weasel had said something funny, and a voice in the shadow behind the table jeered: 'From one who's done it—I don't think!'

Another man asked Weasel Garavan with a smirk: 'Are you telling us you 're lord and master on your own floor?'

Just then Larry Joe came in calling: 'Time, gentlemen, time, *and* a little less noise, if you please.'

Peter's Ned stood up, saying he was to be the Queen of the May, so he 'd be called early in the morning. All the men in the snug laughed and shook hands with him, wishing him luck with the woman of his choice. When he had left, the man they called Charlie suggested that someone who was lord and master in his own house should invite them there for a shuffle of the pack.

They all looked towards the Weasel, who said throatily: 'Who says I daren't? I 'm boss once I cross me own threshold. We 'll have a short game if ye 'll bring a gallon.'

ONLY two men, as well as Charlie, the Weasel, and my uncle, were anxious to play cards. Larry Joe filled a gallon jar with

porter, and Charlie carried it unsteadily as they straggled down the road. I kept near my uncle. The five of them halted outside a small house in which no light was showing. Weasel Garavan told them to keep quiet. He went in and lighted a paraffin-lamp, then beckoned from the door.

The four men followed in a foolish file on uncertain tiptoes into the cottage. The Weasel produced mugs, which my uncle filled from the porter jar, then he searched the shelves of the dresser until he found a pack of cards that were greasy, frayed, and faded. The five men sat unstably round the table.

I tried to watch the game, but soon fell asleep on the creepie-stool in front of the raked fire. I woke up to hear loud voices round the table, while the Weasel urged his guests to be silent. He jerked his thumb towards the room door and whispered: 'The cat isn't away, you know.' When the men were quiet, he whispered again: 'One thing is certain, anyway, whether he got his nap or not, ye have me skint.'

'Well, that 's happened many a good man before,' Charlie said in a funny whisper. 'I 'll lend you. I don't believe it 's unlucky to lend when you 're winning. I 'll lend you a quid.' As he pushed the coins across to the Weasel he exhorted: 'Count them careful now, for fear I 've given you twenty-one bob.'

My uncle dealt the cards next. The others all said: 'Pass me.' When it was his turn he flicked his ear with his forefinger and announced: 'If I lose Kate and the child, I 'll risk four.' He won the call and remarked brightly: 'One tanner per man, per boy.'

The losers passed over their stakes, and the Weasel moaned: 'Boys, oh, boys, me lovely little round tower that isn't mine is attacked already.'

There was a creak from the door of the room, but none of the card-players heard it. Looking across I saw a tall, gaunt woman, in a dirty white nightdress, glaring at the men round the table. Her thin hair was twisted over bits of newspaper. For a few seconds she watched the players, her mean lips twisted in disgust, then her bare feet padded stealthily until she stood behind the Weasel. She grabbed the stack of coins beside him on the table, jerked the stool on which he sat, and sent him sprawling to the floor.

The four other men stood up as quickly as they could while she rasped at them: 'Out with ye now! Out of the house this minit, ye pack of drunken louts!' Then she vanished into the room again.

My uncle and the three other men shuffled foolishly from the kitchen. The Weasel collected himself and followed to the door. 'I 'm sorry, Dan,' he apologised, 'for this—this untimely finish.'

In the darkness outside the house Charlie laughed: 'Lord and master, how are you!'

'Easy there, now,' advised Weasel Garavan. 'Maybe you think a woman should have no say at all in her own house.'

When we reached our gate my uncle gripped my shoulder and whispered earnestly: 'You listen to me, young shrimp. Take warning from what you saw just now. Keep wide of the women when you grow up. You follow *my* good example there.'

Flame on the Wind

I stood amongst the trees at eventide,
And heard the wind soft harping everywhere
On branches covered bright with yellow leaves,
Which met above with incandescent glare.
But while I watched, the wind seemed changed to flame
As burningly it swept throughout the wood,
The dying sun on wings of red and gold
Set bonfires glowing in the solitude,
And following on the flames, a cold grey mist,
Whose chilling vapours smothered fires of light,
While heavy shadows draped the river banks
As darkness settled down in arms of night.

EDITH A. VASSIE.

Explorer's Tree

On the Track of Edmund B. Kennedy in North Queensland

GLENVILLE PIKE

IT was at the Cairns agricultural show in north Queensland in 1948 that I met the elderly bushman, looking rather uncomfortable in his smart city clothes. Shows of this kind, where the wealth of a huge district is displayed, attract cattlemen, miners, farmers, and bush-workers, as well as town-dwellers, from far and near; for all, as well as being a fruitful source of entertainment, it is an annual meeting-place.

Waiting for the horse high-jump to begin, the bushman and I got to talking of the bush and explorers. The old man said to me: 'There is a tree up on the Mitchell River that I think was marked by Kennedy about a hundred years ago. I saw it first back in '08, and the letterin' on it was pretty clear then. Don't know of anyone else having seen it. In bloomin' wild country, though—rough too.'

A tree marked by Kennedy! With all trace of his route shrouded in mystery, no trees marked by this explorer had previously been found. In May 1848 he and twelve men landed at Rockingham Bay, 100 miles south of Cairns, and rode inland over the jungle-covered coastal ranges and northward up the eastern side of Cape York Peninsula, nearly to Cape York, traversing country never before seen by white men. Illness and attacks by hostile aborigines so impaired the explorers' health that Kennedy had to divide his party 150 miles south of Cape York and push on with three white men and a blackboy, Jacky. Further on, these three men were left, and Kennedy and Jacky went on alone, starving and ill, with hordes of hostile natives dogging their footsteps. Poor lion-hearted Kennedy was speared when he was within twenty miles of the waiting ship. Jacky buried his leader and hid his papers and journals, and carried on through fœtid mangrove-swamps, swarming with huge man-eating crocodiles, and across rivers swollen by the wet season rains, to Cape York. Thus the faithful blackboy was able to tell the terrible story, but two men only out of the twelve left at the two camps on the way were found alive and rescued. The others had died of starvation and despair.

And now, after one hundred years, the existence of a tree marked by Edmund B. Kennedy had been disclosed. Historians with whom I was in touch became interested immediately. Would I make an expedition out to the Mitchell River country, find the tree, and photograph it? I would.

I ENLISTED the services of my friend John, a professional photographer, who possessed a sturdy four-wheel-drive 'blitz buggy' of recent war vintage—just the vehicle for such a trip through rough country. We were taking no chances, and just as well we didn't. With a week's supply of food, drums of water, petrol and oil, tent and camp equipment, ·303 rifle, etc., we left Cairns one hot morning in August with the blessings of the Historical Society of Queensland and the Royal Geographical Society of Australasia, of which I am an active member.

The first fifty miles was covered in record time over splendid bitumen roads, but the thirty miles from Mareeba to Dimbulah was not so pleasant. Bone-shaking potholes lurked beneath a foot of white dust that enveloped us in clouds as fine as flour.

From the little tobacco-farming settlement

of Dimbulah we took the Mount Mulligan track northward, an atrocious trail that led to this small outpost of civilisation in the ranges. There had been no attempt at road-making, and the creek and gully crossings were nightmares. I was used to the incredibly rough and unmade tracks that usually pass for main roads in outback Australia, but this was one of the worst of any. From the summits of stony ridges, covered in rain-starved ironbark-trees, we caught glimpses of range upon range of serrated mountains stretching away northward, and a little to our left the flat-topped bulk of rugged Mount Mulligan dominated the landscape.

On the only level stretch of country for miles, we passed a cluster of groggy tombstones beneath the shade of mighty ironbarks on a river-bank. The track wound between heaps of broken bottles; foundations of vanished houses showed beneath the long, tinder-dry speargrass. A town called Thornborough had flourished here in the 1870s, depending for its existence on the great quantities of gold found along the near-by river. When the gold petered out, the town and its people disappeared, leaving only the dead in the mouldering graveyard, and heaps of bottles that told of many a wild night at some of the forty-odd pubs this roaring gold-rush town once boasted.

Ten miles further, that took us over an hour to negotiate, across yet another treacherous bridgeless creek and up a tyre-gashing ridge, and the lonely little hill-town of Mount Mulligan lay below us in the shadow of the rugged perpendicular mountain that gave its name to the township. A hundred million tons of steam-coal are said to exist beneath it, but only two mines are being worked.

A curious crowd had gathered around the only hotel, for strangers are a rarity in Mount Mulligan. Few are willing to brave the perils of the track to get to it. We went across to the police-station opposite, hidden behind a prickly hedge, to seek directions. The sole representative of the law, in singlet and shorts, possessed the friendliness and unconventionality of the typical Australian bush-dweller. On hearing the object of our mission he looked serious. When asked the state of the track, he laughed. 'There is no road at all,' he replied. 'But you are lucky. Two prospectors came in from the Mitchell River country only yesterday. They had a truck of sorts and blazed a few trees on the way in. It is only thirty miles to the Mitchell, but they said it took them two days to come in. They broke a spring, and fixed it with a sapling. They said the country was not too rough; you will be able to follow their wheel-tracks. Still, it is lonely country out there. If you are not back in four days I'd better ride out and look for you!' He pointed out the wheel-tracks we had to follow, twisting around a cricket-pitch, past a few tin shacks, and skirting the tiny cemetery.

NOT knowing whether to be heartened or discouraged by the trooper's words, we followed his directions and camped in a gully a mile or so beyond the township. Even at that short distance we were in the wilds. A prowling dingo howled over the ashes of our camp-fire during the night and came sniffing around the wall of the calico tent. A shot fired at random sent him scuttling off to join the pack scouting the near-by escarpments. A nearly-full moon rode in a cloudless star-spangled sky; the season was late winter, but it was winter in name only.

We breakfasted in the cool dawn, and the sun had just touched the rugged bluffs of Mount Mulligan with rose when we were off, the first bumps over a boulder-strewn gully finding the swelling bruises of yesterday. For a few miles there were signs of an old wagon-road, its course eroded to become a gully, with tracks showing that the prospectors' truck had jumped it at intervals. We followed faithfully and jumped, too, but I think only John and I did the jumping; the truck just crashed over the washouts somehow, but it could not have roared more than its occupants.

Gully after boulder-filled gully we crawled down into and crawled out of in extra-low gear. One fearful ascent was particularly steep—a series of ledges of knife-edged slate. The only thing to do was to charge it and bounce upward in a succession of leaps and to hang on like grim death; it was miraculous that a truck could survive such a test without damage. The occupants, however, were not so sturdy, and the number of bruises mounted.

The first crossing of the mighty Hodgkinson River was reached—a wide sandy bed in several channels, the 'islands' densely timbered and a jungle of luxuriant wild rubber-vines. Somehow, we slid down the soft bank and

roared through deep sand to the first 'island'; next along it through the rubber-vines and overhanging limbs that tore the canopy over the back of the truck to pieces; then across another channel of sand and along another island around the edge of a lovely water-hole; lastly, in a zig-zag fashion up the steep bank on the far side. Certainly not a crossing that could be negotiated in wet weather!

Twisting and turning between the gnarled old box- and ironbark-trees and the loose boulders on the ridges, and over countless gullies, we pursued those snaking wheel-tracks. For a short distance they rejoined an old wagon-road, and we found ourselves on a ledge barely wide enough for the truck, with a sheer drop into a miniature gorge fifty feet below. And, horror of horrors, running across this ledge was a washout that we were expected to 'jump.' A few minutes' work rolling flat stones into place saved us this risk, however. I did not breathe freely until we were off that dizzy ledge. But those interminable wheel-tracks continued to follow the spurs of a parallel range with invariably a broken gully with an S-bend crossing halfway up. In low gear we crawled along, the protesting engine boiling furiously and lapping up petrol and oil. We were using a gallon of petrol every two miles and we began to have fears that our supply would not be sufficient to get us to the Mitchell and back to Mount Mulligan.

MID-MORNING found us on more level country at last, with the queer red bluffs of Mount Mulligan close on our left. The northern end of this mountain is remarkably like Ayer's Rock, the world's largest rock, in central Australia, the sheer cliffs marked by parallel seams suggesting the wave-marks of some prehistoric sea that perhaps once lapped its volcanic walls. Numerous cave-mouths showed towards the summit, which was covered in bush; huge eagles soared majestically above it. There is a tableland with deep lagoons teeming with wildfowl on top of this weird mountain, called Woothakata by the primitive native tribes, for whom it was a stronghold since time immemorial, and from where they launched many a bloodthirsty attack on the pioneers in days gone by.

More jagged boulders and deep sand met us at the second crossing of the Hodgkinson River, and keeping on after those faint wheel-tracks, for whose existence we were truly thankful, we rounded the northern buttress of Mount Mulligan and looked into a purple-shaded gorge guarded by an unnamed mountain, with other unnamed ranges to the north and west.

With a temperature of close on 100 degrees Fahrenheit in the shade, the weather was typical of the dry season in tropic north Queensland—cloudless sky, parched ground, and withered grass, every creek that would be a torrent in the wet season waterless. Thirty miles does not sound far, but at four miles an hour it seems an endless distance. The tally of creek crossings was ninety-odd, without more than a hundred yards of level country between them. The Mount Mulligan track appeared like a highway now.

Descending one of those boulder-strewn hillsides into yet another deep gully, the truck suddenly gained alarming speed, and, hurtling downwards, buried its nose in the far bank of the gully at the bottom. The brakes had failed. The engine also refused to start. Eventually, John got it going and drove it up on to the crest of the next ridge, where the steep decline made progress without brakes unthinkable. The oil had leaked out, and neither of us being mechanics, and being without brake fluid, we were in a quandary. What to do? We could go neither forward nor backward without brakes, therefore they must be fixed—yet how? We studied the instruction-book for an hour, but its Yankee terms only served to confuse us the more. Finally we found where the oil had to go—if we had any. We solved that problem by using engine-oil—a last chance that came off.

Replenishing the water-drums and -bags from a warm pool in a nameless creek, we climbed stiffly aboard again. Sundown that day saw us at our destination—the mighty Mitchell River at last. There, at the junction of the Watson and the Mitchell, was the only large area of flat land we had seen all the way.

We camped on a high bank above the junction, from where we could look down the Mitchell towards the west and the plains of the Gulf country, the river's estuary four hundred miles away without a town or a road between. The Mitchell was all of a mile wide, in several channels, and full of dense timber, hiding-places for innumerable wild pigs. Fat perch, bream, and garfish lurked by the shadowy banks—the Mitchell is one

of the few rivers in the north that run all the year round. Crocodiles are plentiful in its lower reaches, where in the wet season the river is a force to reckon with, twenty-five miles wide in flood-time not being unusual.

At dusk, literally millions of flying-foxes, giant fruit-eating bats, emerged from the river-scrubs and flew off in clouds in quest of food; a few stayed to squabble over the honey-filled flowers of the river-gums all night long. The grunting of wild pigs was also heard.

THE search for the explorer's tree was a big task, and not without its hazards. Every tree in a likely spot had to be examined up and down the river for two miles either way of the camp. On one of the stony flats I nearly stepped on a huge rock-python; John killed it, and it taped 12 feet 6 inches.

I had almost given up hope of finding the tree, and had actually seen it and passed it by, when something made me return for a closer scrutiny. It was the very tree! A bush-fire had partly charred its ancient trunk, that had been blazed by the axe of a man long since dead. I made out this inscription :

K . . . . . Y
L.T. . .
15 SEP. 1848.

There was no mistaking it. The date was very plain, and no one else but Kennedy or his men could have carved it there. Thirty years were to elapse before the next known white man was to pass through that country in the wake of the Hodgkinson gold-seekers.

As I stood there, in the shade of that gnarled old eucalypt, my mind went back to brave Kennedy and his men, weary and hungry, with worn-out horses, camping there on that very spot and carving the inscription on this venerable old tree on a hot day similar to this, just a century ago. A thousand miles away was Brisbane, the nearest white habitation in those days. Five hundred miles to the north was Cape York, and a waiting ship, which only one of them was destined to reach.

Turning the pages of Carron's diary, I read: 'Costigan was responsible for carving the date and number of each of our camps on a near-by tree.' And: 'At ten by the clock we arrived on the bank of a noble river . . . which Mr Kennedy thinks to be the Mitchell of Leichhardt. . . . It was our practice to camp from the heat from ten o'clock until four, then travel on till six. . . . We kept watch this night for fear of the natives.'

Carron was Kennedy's second-in-command, and his private diary is the only connected record of the expedition that exists. The blacks on the Mitchell were very hostile and attacked the explorers several times, 'three spears going quite through one of our tents.' The blacks have long since vanished, but this lonely corner of the north has otherwise not changed since Kennedy's day.

Photographs were taken, and we returned to the camp, enjoying a swim and fish in the river. Another day we again searched for other marked trees, and found two, about four miles down the Mitchell from the first tree. One was marked 'K' and another 'C'—possibly a further relic of the passing of the Kennedy expedition.

The time on the Mitchell passed all too quickly. Camped there in the quietness and loneliness, it made one realise the vastness of Australia, and its scattered population. Here, thirty miles from a township, was utter wilderness and isolation; it came to within a mile of that township itself. Some of the roughest country in the north separated us from even the meagre comforts that Mount Mulligan could offer.

THE return journey was a repetition of the outward trip. An unseen tree-limb succeeded in squashing the truck canopy-frame almost flat. Small trees ripped the canvas to ribbons. Sharp rocks had worn down the heavy-duty tyres. It would have required a mathematician to count our bruises. Halfway up the narrow cutting out of the Hodgkinson River the truck stuck fast, wedged between the banks, the wheels in mid-air, two feet above the level of the track. It took a couple of hours of solid 'navvying' to extricate it.

Mount Mulligan at last with its timely petrol bowser. Stray horses drowsed in the shade under shop verandahs. A dog scratched fleas in the dust of the main street. Mount Mulligan dozed also.

The policeman was pleased to see us. We had saved him a long ride by our reappearance. In answer to my description of the track we had followed, he said: 'Well, I told you there was no road, but it is not very rough country,

really.' I declined to comment, but I was anxious to hear something of those hardy prospectors whose phantomlike tracks we had so thankfully followed, and of the special kind of truck they must undoubtedly possess to negotiate such dreadful terrain.

'They got in here about nine o'clock at night,' the trooper said. 'They had no headlights, so had a carbide lamp stuck up in front of the radiator. . . . Oh yes, we have some of the best truck-drivers in Australia here in Mulligan. They have to be good. . . . The prospectors' truck? Just a 1929-model Chev. —no hood, all the tyres showing canvas, and they don't bother carrying a spare. The truck has no brakes, either—they were torn off in the bush years ago!' That worthy trooper is probably still wondering why I sat down rather suddenly on his verandah steps.

Fish-Farming

IAN WOOD

TALK of export trade usually makes us think of whirling looms or noisy machine-shops rather than of quiet Highland glens with rising trout dimpling the pools of a river. Those trout, however, play their part in our overseas trade through the medium of fish-hatcheries.

Somewhere about the middle of last century some people with interest and foresight began to experiment with the artificial hatching of trout and salmon for the betterment of our own rivers and lochs. Progress was disappointing, and wholesale disasters were common. Not to be dismayed, however, the pioneers kept on and proved eventually that artificial hatching and rearing could be carried out successfully.

When it became known that fish-hatcheries on a commercial scale were being established, orders from overseas for Scottish trout, notably Loch Leven trout, began to arrive. Attempts at exporting young fish then started, but failure after failure proved that to send fish in tanks through the tropics, however much attention they received, was a hopeless task. Export of trout, it seemed at that time, was impossible.

Then a great discovery was made. At a certain stage of spawn incubation it was shown that development could be retarded through the lowering of temperature. It was a simple step thereafter to pack eggs in wet moss, sandwiched in ice, and to send them abroad where, when placed in running water of normal temperature, they completed their hatching. And so it came about that Scottish trout found their way to the farthest corners of the globe, and fish-breeding became a business proposition.

I VISITED a leading Scottish hatchery recently and counted over thirty neatly-laid-out stock-ponds. The ponds are fed from a hill burn of crystal water, and each pond has, of course, fine-mesh gratings at inlet and outlet. Stock trout in the ponds are graded by their age, and range from lively little fingerlings to more sedate three-pounders. All the fish are fed regularly.

In the good old days between the Wars boiled mussels and clams were fed to the trout, and rate of growth was rapid. Some of the stock-ponds in those days contained fish weighing between five and six pounds.

It so happened that one of the big fellows' ponds was near the iron railings which enclose the hatchery, and an angler, returning from

a hill loch late and light of basket, decided to try a cast over the railings. The angler, incidentally, had been drowning his sorrows most of the day, and after casting over the grass verge sought solace from what remained in his bottle. In the grey dawn he was discovered sleeping soundly, with great trout strewn all over the grass, apart from those that were in his basket. There was a sad sequel in the local court, and soon the iron fence had an addition to its height to prevent any further interference from bottle-fed anglers!

SPAWNING-TIME in the hatchery extends from October until perhaps January; and cold work it can be. The popular fish are Loch Levens, but usually the first fish to be spawned are native river-trout, which are trapped as they go to spawn in the natural way. So many of these are used each year to keep a certain amount of wild blood in the stock.

When the main spawning work is on, the stock-ponds are netted with a sweep-net. At the end of the pond the net is folded over and a mass of churning fish imprisoned. A hand-net is now scooped through the trout and with its contents it is placed in a large tub of clean water. Females ripe for spawning are taken in expert hands and spawned into a basin. There is a special way of holding the trout, and a quick but gentle sliding grip with the right hand ejects the spawn. If properly done, this does not injure the fish in the least. Spawned fish, and unripe ones, which will be netted again later, are returned to the pond outside the net. When a sufficient number of eggs have been collected, they are fertilised by having a male fish spawned over them. And so the spawners go through each pond.

In the hatchery buildings there are long lines of narrow tanks through which flows a constant water-supply. The tanks are stepped to form little waterfalls, thus aerating the water. Each tank is fitted with glass-grilled trays and on these the fertilised eggs are placed. Each tray holds about 4000 eggs and the hatchery when full has in it some 7,000,000 eggs.

Hatching-houses are kept fairly dark and at a constant temperature. The trays are inspected, by candlelight, each day, and any bad eggs are removed. Even after the fry hatch out they remain in semi-darkness, and it is only when they are transferred to their first pond that the tiny fish see the full light of day. Like chickens, baby trout live at the earliest stage on the contents of the yolk-sac which hangs below them, and after it has been absorbed they are fed regularly. Natural plankton or finely-shredded liver is their first food.

WHILE export trade is in spawn only, because of tropical travel, home stocking is commonly carried out by tank transport of young fish—one- or two-year-olds. In both directions demand generally exceeds supply, and with the increasing popularity of trout-fishing as a sport our home waters would be in a poor state if it were not for artificial stocking.

Salmon, sea-trout, and coarse fish can be artificially hatched. In the case of migratory fish, of course, the young must be released in time for natural migration. It is well known that salmon and sea-trout habitually return to the river in which they were hatched, and, similarly, hatchery-reared fish go back to the river or loch to which they are introduced. Any polluted salmon river—such as the Clyde—could, if cleaned, be made a good fishing river again in a few years by introducing young fish to the headwaters. If left to itself, a cleaned river might go for many years before it became restocked, for the simple reason that, destitute itself of native stock, it has but little chance of other stock as only about three salmon per thousand do not return to their birthplaces.

Fish-farming began purely for stocking purposes, but nowadays it has been found to be a profitable business both at home and abroad to rear, feed, and fatten fish for the market, just as a farmer does with sheep and cattle. Last year, for example, large numbers of rainbow trout were sent to our fish-markets from Dutch fish-farms, and on the Continent, particularly, coarse fish are farmed and sold in like manner.

There are fish-farms, too, that specialise in aquarium fish and aquatic plants, and a kindred line is the breeding of edible frogs on a commercial scale. And so in the years to come it may well be that some of our poorer arable farms, wet places that defy proper draining, will increase their value so far as our food-supply is concerned by having their fields turned into ponds.

Your Garden in October

IN the north one may get the first of the serious autumn frosts late in September, but, generally speaking, all over the country the worst of the trouble occurs during October, and therefore, from the beginning of the month onwards, no plants that may be cut by frost should be left out of doors unless they are carefully covered with continuous cloches. The chrysanthemums will be got into the greenhouse; the late-sown French-beans will have the tall barn cloches put over them; the frames may have to be covered with mats and old sacks at night-time; and in the glasshouse it will probably be necessary to reduce water-supply, for there is no need to add moisture to the soil when the leaves are not cooling themselves down by evaporating water.

In the flower garden it is a great month for propagating perennials by root-cutting. There are certain plants which have thick fleshy roots. I refer to the oriental poppies, the anchusas, the eryngiums, the Japanese anemones, the oralias, the statices, and the gaillardias. As a rule, these should be cut into lengths 3 or 4 inches long, care being taken to make the cuts square at the top and pointed at the bottom so that there will be no doubt as to which way up they are to be planted. The cuttings are placed in a cold-frame in sharp silver-sand. They can be packed in quite closely, and if they are protected from the winter rain they soon callus and the tops bud up, and as a result many plants will be ready to be put out into the open next year.

Some have had trouble with eelworm in phlox, but phlox may also be propagated by the use of root-cuttings. The plan is to dig up the plants, sever the roots, and proceed to wash them thoroughly in plenty of running water, the idea being to wash away any eelworms that may be present. Cuttings can then be made, and these may be buried, not necessarily upright, in seed-boxes filled with sharp sand in such a manner that they are an inch deep. Next, the boxes are placed in a cold-frame, and by the time the spring comes nice young shoots will have appeared, which can be planted out into a nursery first if desired, or straight into the herbaceous border.

Most of the old bedding will have finished flowering and it will have to be got up so that the spring-flowering plants can go in as a replacement. For some it will mean putting in wallflowers; for others, polyanthus or forget-me-nots, if this has not already been done. The gladioli corms, like Colvillei, can be planted this month also, though I find that in parts of Scotland and in the north of England it is essential afterwards to put a layer of horticultural peat all over the surface of the soil, to a depth of an inch or so, in order to give some extra protection. The lilium testaceum can also be put in now, as well as the Canterbury bells, the evening primroses, the foxgloves, and the sweet-william.

Those who have to cope with rather damp gardens must keep a sharp lookout for slug damage. It is possible to make up a barrier consisting of equal parts of finely-powdered copper-sulphate and hydrated lime and then to use this sprinkled right the way round the plot or around an allotment. Slugs invariably travel on the surface of the ground, and they are always killed by this chemical mixture. Some have dug in this product at an ounce to the square yard with great success, but the difficulty is that it is always dangerous to apply dressings of copper-sulphate to soil, and therefore care must be taken not to exceed the dose prescribed. Another excellent method of getting rid of slugs and snails is, of course, by the use of powdered metaldehyde and bread-crumbs. If little heaps, covered with a loose tile or slate, are put about the garden, the slugs come for many yards and die at the feast provided.

It pays to drop a handful of hydrated lime over pyrethrum and right over the perennial blue scabious, but around delphiniums and lupins it is best to spread finely-divided coal ashes, and this is especially true of lupins, of course, which hate lime in any form. Where I am we usually aerate our lawns this month by what is called the plunging system. The fork is pushed into the sward perpendicularly every 2 feet and slightly moved backwards and

forwards. The big golf-courses use the modern spiked roller instead. Having treated the lawns, the deciduous shrubs may be planted, as may the lily of the valley, in a nice shady spot.

We must now turn to the fruit garden, where there will be a good deal of picking going on. Before storing, the keeping apples should always be allowed to sweat for a fortnight, and this perspiring can take place in the open or in the storehouse with all the ventilators open so that a good wind can blow through. It certainly pays to wrap each specimen in the special oiled tissue-paper which can be bought for the purpose. If any readers have difficulty in obtaining these wrappers, they may, of course, write to me. When picking the apples, be sure to remove as you proceed any brown mummified specimens of fruits which may be seen on the branches, because these will very quickly spread the brown-rot disease the following season.

Towards the end of October, it will be possible to start pruning, and it is as well to deal with the red- and white-currants first. Here it is a case of cutting back the side-growths to within an inch of their base and the leaders back by about half, making the cut just above an outward-pointing bud. It may be necessary to cut out a centre bud, for it is useful to have red-currant bushes goblet-shaped. At the same time, if any suckers are growing, see that they are removed; in fact, it is ideal to have the red- and white-currant bushes growing on a leg, as we gardeners put it—that is, a short stem.

Having coped with the red-currants, prune the morello cherry. Here the plan is to thin out the shoots with the object of retaining the wood that has been made during the 1950 season, because it is on this wood that the cherries will be borne next year. With wall trees, one must tie these shoots back to the wires and see that they are spaced out as evenly as possible all over the wall-space at a distance of about 2 inches from one another. With bush trees, just thin out so that there 's no rubbing wood, no crossing wood, and in such a manner that the branches are not trailing on the ground.

The peaches and the nectarines on the walls will also be pruned and tied in. Those who have been sensible enough to carry out the normal dis-shooting in the summer will now find the work easy, for they will cut back the wood that fruited this year and tie in, in its place, the lateral at the base of this young wood, which was carefully preserved for the purpose. It is advisable to place an order now for the colloidal copper wash, so that this can be applied very early next spring, the moment the buds start to move. This is the only way of curing the peach leaf-curl disease, which proved to be extremely serious in 1950.

In the vegetable garden there is the celery to earth up. How essential it is to grasp the sticks firmly in one hand, or better still two, before the soil is drawn up to them. I always find it quicker to work in pairs, one doing the grasping, the other the initial earthing. When one has to work single-handed, the best thing to do is to tie the sticks up together with raffia first. You see, it is so important to prevent the earth getting in between the stems, because there is always the danger that earth may have with it one or two little slug's eggs, and much trouble will be experienced later as a result.

Fork over the soil that is to be used for earthing, so as to loosen it and get it down fine. It is then warmer and easier to use. Having completed this work, go over the brassicas, and especially the Brussels-sprouts, and cut off carefully all the basal yellowing leaves. These are not helping matters, and they may encourage pests and diseases. Some in windswept cold situations may like to heel over the broccoli to the north and north-west so as to prevent damage. This work is facilitated if a small spadeful of soil is removed on the north side and, after the plant has been heeled over, is placed on the south side.

Cut away the tops of the asparagus before the berries start to fall and, if there are any asparagus-beetles still present, dust thoroughly with a good Derris preparation before this work is done. In the south it should be possible to make a sowing of broad-beans about the end of the month, plus a sowing of a good round-seeded pea. Please note the word 'round-seeded,' for the majority of the wrinkled varieties do not stand the winter as well. Thin out the winter spinach to at least 6 inches apart, and use the thinning in the house as a vegetable. Cut down the Jerusalem artichokes to within an inch of soil-level to prevent the tubers being lifted in a heavy wind, but protect the globe artichokes with straw.

I shall be glad to help readers with their gardening problems. Write to me through the Editor, kindly enclosing a stamped addressed envelope for the reply.

W. E. SHEWELL-COOPER, M.B.E., N.D.H.

The Boiler

WILLIAM E. BRUCE

ONCE upon a time—the time was about 1850—a man built a boiler. He was a technical and practical man and wrote a book about building boilers, making special mention of this one, for it was a boiler before its time, designed to carry the highest pressure ever attempted—eighty pounds. He instanced the difficulties of construction, and concluded: 'The author does not believe that boilers capable of carrying a higher pressure will ever be constructed, and he certainly hopes not.' It was an achievement. He died, years later, aged and bewildered, when they were building boilers to carry two hundred pounds pressure.

The boiler was placed in a ship, a pleasure cruiser which carried passengers long distances. As it worked at higher pressure than the boilers in other ships, the vessel was enabled to go faster, to the delight of its owner and the envy of his rivals. It was queen of the river—but not for long.

Bad luck followed the vessel. The boiler blew up, to the consternation of its owner and the delight of his rivals, for it was an age of keen competition. Fortunately, there was no loss of life, but the top-hatted gentry and crinolined ladies who formed its passengers were badly shaken.

Actually, it was not the boiler's fault. In an effort to achieve even better results, the engineer had hung additional weights on the safety-valve, so the pressure was much increased, and this was too much for the boiler. The papers spoke of a boiler explosion, but this wasn't true. The boiler was intact, but the safety-valve had blown off. The effect was the same, and the public refused to travel on the vessel.

So the owner was forced to get rid of the boiler and substitute a more conventional one carrying fifty pounds pressure, the same as his rivals. He sold the old boiler to a mill-owner, who used it in his mill to drive the machinery and for all purposes where steam was required.

THE boiler did its work well, without misadventure for many years, but the Board of Trade and insurance companies were organising themselves, sending their representatives out to examine boilers to see that they were properly cared for and strong enough for the work required of them. The exuberance of private enterprise had to be curbed.

They tested the boiler, filling it with water and pumping it up to much more than the working-pressure, and it remained tight, but they didn't like it. The boiler was old-fashioned. It was iron, and they were building them of steel now, so they advised the owner to get rid of it. But he took no notice, for they couldn't compel him; the boiler met their requirements.

Year after year it worked satisfactorily, and as often as the surveyors came to test it, as often it confounded them by remaining tight and showing no signs of weakness.

Age must tell, and eventually its plates wore thin. The surveyors seized on this and, though it remained tight, their formulae said that its thickness was only suitable for a reduced pressure. So they lightened the safety-valve and allowed it to carry no more than fifty pounds.

Still the owner kept it. Later, as the plates wore thinner, they reduced the pressure again and the boiler became useless for its purpose and he had to get rid of it. He left it on a waste ground, where small boys threw stones at it and played hide-and-seek in its furnaces.

EVENTUALLY, the boiler became the property of a market-gardener. He had acres

of market-garden and rows of greenhouses—forty of them. He needed a boiler to supply steam to heat them. A large boiler, for volume was required. Pressure didn't matter; a few pounds would suffice.

His garden was on the steep slope of a hill where it caught the afternoon sun. It was reached from the top by a road which tapered to a footpath overlooking the garden and the greenhouses, row upon row, down the slope. Then a space between the last one and a dwarf wall. After that, a sheer drop of five hundred feet to a tiny village below. An ideal spot, free from interference.

The boiler was installed in the space separating the greenhouses and the dwarf wall. A concrete dug-out, lightly roofed over, was made to house it. There it rested, humming contentedly under ten pounds of steam rising gently to the greenhouses, tier upon tier, above it. The furnaces, into which black and sweating firemen had once shovelled coal, now were tended by a boy, and burned coke, wood, and garden refuse. It was the dignified but still active retirement of old age, for the boiler had outlived its maker by many years.

The market-garden flourished and prospered. But nothing can withstand the toll of time. The boiler's plates became woefully thin. Leakages filled the dug-out with water.

Again the boiler had to be scrapped. A new boiler was brought and placed handy to take its place in the dug-out. Small and compact, its furnace oil-fired, its fittings new, bright, and shining, carrying a high pressure which would be reduced in the pipes leading to the greenhouses. This was the modern way, economical and efficient.

THE old boiler was to be removed, for it was wartime and metal was scarce. The boiler would fetch more as scrap than its original price to the market-gardener.

At first they thought of breaking it up in place, but that would have meant carting it, piece by piece, up the hill, a half-dozen journeys. It was decided to take it up whole.

They removed the dug-out roof and lifted the boiler out. A rope bent around trees and attached to the lorry on the road at the top of the hill would haul it up.

It was a bigger job than contemplated. The boiler seemed reluctant to move. First the rope broke, then the lorry wheels skidded, and finally the engine stalled, but they dragged it up at last, back past the ends of the greenhouses, then up the slope and forward along the footpath to where the road widened. Here they took the slings off it and wedged it in place with a baulk of timber, an old tree-trunk they found near by.

It could not be lifted on the lorry in one piece, for that would have made it too high to pass under the bridges that spanned the road. The burner would soon cut it in pieces. Already, one of the men, wearing blue goggles and visored cap, was adjusting the portable burning outfit. The boiler that wouldn't die they were going to destroy.

The yellow flame, hardly visible in the sunlight, sprang to life with a plop, then, as the air was turned on, shrank to a thin, blue streak, hot enough to melt the hardest steel. It hissed and spat as it impinged on the old iron, turning it to a dull, angry red, which became white-hot as the flame bit into the metal, sending it running down the sides in a molten stream, crackling sparks in all directions.

INTENT on the job, the burner didn't notice the old tree-trunk was on fire. Not till the smoke from the burning wood blinded him did he turn from his work. It was nothing new for inflammable material, near a burning job, to get on fire, and he threw out, carelessly: 'Water there.'

There was no water—none nearer than the bottom of the market-garden, and the hose wouldn't reach that far. They tried to get some from the lorry radiator in a bucket, but it would take half-an-hour to fill it from the little drain-tap.

They seized crowbars and dug them into the old tree, but this only made matters worse. The charred and burning wood splintered in all directions.

Just in time they sprang clear as the boiler toppled over and rolled down the slope. The first greenhouse it met provided a spectacle. The crash. The cascade of glass, the particles, reflecting in the sunlight, falling in all directions in a glittering shower. A never-ending shower, for the light structures offered no obstacle to the boiler's progress, every revolution adding new momentum. One by one the greenhouses blew up in a tinkling explosion of crystal.

The watching men gasped, visualising the end of the journey. The dwarf wall would

never hold the boiler. It would plunge straight down to the village below. The destruction would be terrible. They thought of manslaughter verdicts, and their faces blanched and their knees shook.

It didn't happen. As the boiler tore through the last greenhouse, leaving it in fragments, it struck a projecting rock, leapt three feet into the air, and fell with a thud of finality into its concrete home.

They took the new boiler away. It would not be needed for some time—not until forty greenhouses had been rebuilt. The old one they left where it was, filling in the dug-out with soft earth. Flowers have hidden everything.

New Power from the Elements

T. S. DOUGLAS

WHEN it was announced in 1945 that atomic fission was an accomplished fact, bold prophecies were made that in the near future man would have at his command a source of power that would make it possible for a liner to cross the Atlantic on a 'teaspoonful of fuel' and that billions of new horsepower would become available for the world's factories. Now, five years later, a more sober view of the future of atomic power for industrial purposes prevails. Scientists are still wrestling with the great problems involved in harnessing the atom, as distinct from using its power explosively, and it is apparent that even when the considerable technical difficulties are solved atomic power will not become the only or for that matter the chief source of power for industry. It will compete with older methods of power-raising, and with new ones as well, and present indications are that, at any rate for several decades, it will not substantially replace its competitors, but will be employed for purposes where it has special advantages—for instance, power-raising in areas poorly placed for the transport of fuel.

FOR some centuries the wind was an important source of power, but the technical inefficiency of the old windmills resulted in their disappearance once steam had been brought into service. To-day the surviving windmills are prized for their picturesqueness rather than for their power. But in recent years advances in aerodynamics have made it possible to construct prime movers driven by the wind with a performance far superior to that of the old windmill, and it seems that, in suitable places, the wind will again become an important source of power.

Big developments are in hand in Britain, and the first large-scale electricity generator operated by the wind will be working shortly. This generator is being constructed at Costa Head in the Orkneys, and at a capital cost of not more than £10,000 will generate 100 kilowatts. It is a pilot plant, foreshadowing a chain of wind-power stations which, it is hoped, will in ten years produce 10 per cent. of Britain's power needs and eventually save 3,000,000 tons of coal a year.

These new generators are very different from the old windmills. Instead of the pleasantly familiar wind-sails, there will be three-bladed wind-turbines supported on towers 200 or 300 feet high. Where winds of 10 m.p.h. or more are usual on the majority of days, the efficiency of these turbines is high and the cost of maintenance is low. Experts have been measuring average wind-velocities at a great number of places round the coasts of

Britain and have found suitable points in the Orkneys, Wales, and Cornwall. At Costa Head, where the first installation is being made, the average wind-speed is about 15 m.p.h. The plan is for current generated by these wind-turbines to be fed to the Electricity Grid rather than to be used for lighting or power in local houses and factories. This overcomes the great disadvantage of wind-power, namely, that idle periods cause dislocation.

This pioneer experiment in Britain may have far-reaching effects all over the world, for there are, of course, thousands of places where winds of moderate or high velocity are common on most days of the year. The Antarctic is particularly notable for its steady winds, and the successful solution of the engineering problems involved in this country may point the way to obtaining the electricity for heating and lighting essential for any exploitation of the mineral resources of the Antarctic continent.

THE tides, which rise twice a day throughout the seas, still present, theoretically, a force which would alone be sufficient to supply the world with all the power it needs. However, since the abandonment of the grandiose scheme to capture the tides in the Bay of Fundy in North America, tidal power has become unfashionable. Tidal power was successfully developed in Britain in the 17th and 18th centuries, and at least one tidal mill is in existence to this day. But, like the windmills, these installations had to yield before the more efficient and convenient steam-engine. Now most of the technical problems have been solved in different ways, including the elimination of the dead periods, and there is little doubt that effective tidal power-raisers could be built at selected points.

The difficulty with tidal power-raising is the magnitude of the work required. The cost has to be considered in terms of fifty or even a hundred millions, and not a unit of electricity is produced until the whole of the vast capital sum has been spent. It is probably this that has resulted in such great tidal-power schemes as that for the Severn Barrage remaining on paper. The cost of the complete Severn scheme, even before the War, was estimated at £38,000,000 to generate 700,000 h.p., the equivalent of 1610 million units of electricity a year. Whether in the future this and other tidal-power projects in different parts of the world are proceeded with must depend on economic factors varying from the price of coal to the development of other sources of power.

One of these sources receiving renewed attention is solar energy. Every square yard of the earth's surface, on an average, gets sufficient solar energy to generate 1½ horse-power. This is really atomic power created by the fission of millions of tons of atoms in the sun every second. Yet, so far, attempts to exploit solar energy have been disappointing, because it has proved impossible, even under the most favourable conditions, to collect more than about 15 per cent. of the available energy. In recent years, however, the Russians have claimed great advances, including the construction of a canning-factory at Tashkent worked entirely by solar energy, and in the United States small solar plants for producing hot water are operating in the subtropical areas. Apart from the difficulty of collecting the energy without the use of cumbersome mirrors, there is the problem of storing the energy during the night. The present outlook for solar energy as an important source of power seems to depend upon the invention of some method for turning solar energy directly into electrical energy.

AMONG the other new methods of power generation of special interest, the heat-pump will, no doubt, be the subject of considerable attention. Its principle, discovered many years ago by Lord Kelvin, has been successfully applied in the last twenty years and depends simply on having two sources of heat at different temperatures—for instance, air at normal temperature and a river at a lower temperature. The principle, which might be described as refrigeration in reverse, has up till now been turned to account only in producing heat for water-systems or space-heating. The temperature which can efficiently be reached is not adequate for steam-raising. Nevertheless, a number of engineers have been hopeful that, by using the difference in temperature between the surface of the sea and the water at a considerable depth, steam-raising will be possible. This is, of course, employing solar energy indirectly. The method remains very much in the experimental stage, and plants to produce appreciable

amounts of power would involve very high capital costs.

Heat from the earth itself for steam-raising was first suggested by Sir Charles Parsons. The principle is simple. Shafts are driven to a depth where water would be turned into steam by the heat of the earth, and the steam is used for turbines. The heat of the earth theoretically represents virtually unlimited power at no cost for fuel, but the engineering problems continue formidable. No shaft has yet been driven to anything like the required depth and the difficulties of controlling the heat are great. This means of power production is likely to stay in the realm of speculation rather than in that of practical engineering.

There will be more immediate interest in the development of gas-turbines and jet-engines for power-raising. Jet-engines have so far been fitted only in aircraft, and the practical difficulties of their use for other purposes are obvious, quite apart from the question of efficiency at low altitudes. The jet-engine will probably never be adopted for sea and land transport, but the gas-turbine, in which the burning gases use their energy to drive a turbine, is coming to the fore with the solution of technical problems, such as the design of gears able to operate at very high speeds and temperatures. Gas-turbines as a source of power for sea transport are now practicable, and it is believed that with sufficient inducement designers could make a gas-turbine-driven road vehicle. Electricity produced by gas-turbines is likely to be generated in the not distant future.

How all these different methods of power production will develop and compete with the earlier methods is a matter of economics. The older coal deposits are giving diminishing returns and there is a limit to the world's sources of oil. There will undoubtedly be big developments of hydroelectric power in the second half of the century, as only a fraction of the earth's hydroelectric resources has been tapped. But the fascinating possibility remains that one of these new power-generating methods may be perfected and produce a revolution comparable to that created by the subjection of steam or the invention of the internal-combustion engine.

Lines for a Lady of Seventy-Two

Too old I am to wander now,
And yet my heart would wander still
Wherever country sights and sounds
Their charm of loveliness distil:

Wherever light on dappled leaves
Comes filtering through in gold and green;
Where bluebells mist beneath the trees,
Or wind sweeps willows' silver sheen:

Wherever white roads wind away
And hills are high and air is wine:
Still there my heart goes wandering,
And still the whole wide earth is mine.

Too old I am to wander now,
But not so old I must forget
The days we knew, the ways we knew;
Their happiness is with me yet.

Too old I am—but what is age,
That leaves my memory free to roam
By loved, remembered, far-off ways,
A happy traveller at home.

MARJORIE HERBERT.

Science at Your Service

SCIENCE AND SPICE

AN interesting discovery has recently been reported by Indian research-workers at Poona—interesting because it is yet another case of man's age-old instincts being found to have a modern scientific explanation and justification. Spices of many kinds have been used as food flavourings for centuries, but it now seems that there is more than a matter of taste in this custom. Spices are natural preservatives which prevent or reduce the oxidation of fats—they are what biochemists call 'anti-oxidants.' When foods become rancid, the objectionable off-flavours produced are due to the oxidation (combination with oxygen) of their fatty ingredients. Formerly it was generally supposed that in tropical areas spices were heavily added to foods to mask rancidity effects. The new Indian investigations show that many spices used will actually prevent rancidity developing. Among the spices found to act in this way were pepper, turmeric, cloves, cinnamon, caraway, nutmeg, cumin, and red chillies.

A NON-BURN MILK SAUCEPAN

A new approach to the trouble of milk or even of stew boiling over or burning in saucepans has been made in a pan with a central funnel or tube rising vertically from its centre. The top of this open tube is higher than the rim of the pan. Water is poured into this central section of the pan, and the milk or other liquid to be heated is poured into the normal part of the pan. Owing to the fact that water boils at a lower temperature than milk or any stew liquid, it is impossible for the milk or stew in the saucepan to boil over or burn.

The appliance is made of highly-polished aluminium and its fabrication from one piece of aluminium is regarded as a triumph of production engineering. It has a heat-resisting plastic handle. The diameter of the pan is 6½ inches, and it holds approximately 1½ pints of milk. The invention attracted considerable interest at a recent exhibition held by the Council of Industrial Design.

UNIQUE DOOR-KNOBS

A noteworthy development in domestic decoration or appearance is the production of door-knobs from solid perspex by a process which is claimed to make them virtually indistinguishable from crystal. Although of such close resemblance to cut-glass, they cannot chip or break, and are smooth to the touch. The base of each knob is chromium-plated. Each pair of handles is available with chromium-plated key-plates, perspex escutcheons, and a spindle. There are several shapes and designs from which to choose. Considering that these handles combine both durability and beauty, the price of a set is not unreasonably high by comparison with good-class decorative handle-sets made of other and more usual materials. Drawer- and shutter-handles of similar construction and design are also manufactured. Indeed, one might well speculate upon the possibility that this modern type of handle-knob will be even more effective as an adjunct of good furniture.

STORING APPLE-POLLEN

In the United States this spring, apple-pollen from 1949's blossom was used for pollinating the 1950 crop. It had been stored throughout the summer and winter in dry-ice. Small-scale tests during the storage period showed that the germinating or fertilising power of the pollen was still actively present when the material was thawed out. It now remains to be seen whether the large-scale tests in orchards this spring have been successful. The collection of the pollen was achieved simply enough. Coarse-mesh screens were placed across the entrances to beehives in orchards. Cups placed below these screens collected pollen scraped off the bees and it was immediately put into dry-ice storage. The principal aim of this work is to extend the cross-pollination range of possibilities in commercial apple-growing. Pollen from late varieties one year could be used with blossom on very early varieties the following season, varieties which in any case often crop poorly through insufficient natural pollination.

A PORTABLE ELECTRIC TOOL

A small general-purpose electric-tool outfit should be of interest to the ambitious amateur 'handyman' and to small-scale commercial engineers. The kit contains thirteen high-speed drill-bits, a 4-inch wire wheel-brush, a 3-inch grinding-wheel, a 3-inch cotton buffing-wheel, and a horizontal stand. Thus, the outfit may be used for drilling, wire brushing, grinding, and polishing. It is easily assembled, and when not in use can be kept tidily in a metal case. It certainly gives the home hobbyist the chance of carrying out operations which normally are possible only in commercial workshops.

AN ENCLOSED-FLAME PAINT-BURNER

The burning off of paint with an open flame can result in fires, and a new kind of paint-removing burner has recently been invented by a Continental company. In this burner the naked flame is replaced by a metal surface heated by propane gas burned in a closed combustion-chamber. Besides the greater safety claimed for this appliance, there seem to be other advantages. Strong wind does not affect the external use of this new burner; there is also no risk of cracking windows. The scorched spots that often appear when woodwork is exposed to the normal flame-burner are unlikely to occur with this enclosed-combustion type of paint-remover. The costs per hour are said to be about 80 per cent lower than those of the usual burner, but this figure is based upon Continental data; however, it is obvious that fuel costs should be reduced to a very considerable extent by the introduction of controlled combustion and air-supply.

The burner has been described as a technical revolution in painting, and within a month of its appearance in Holland more than 2000 of the appliances were being used. It is not certain how soon this invention will become available in Britain, but the European company concerned has already applied for an English patent and is the sole exporter. Readers who have studied the problem of paint-burning will recall that numerous attempts have been made in the past twenty years to substitute electric heat for the open flame of the traditional burner, but in general the use of electricity has involved many practical difficulties. An enclosed-flame burner would seem to fill this gap far more hopefully.

ELECTRICAL-IMPULSE CLOCKS

Many people suppose that the modern clock which is connected with a mains supply is the only type of electric-clock. This is far from the historical truth. The first electrically-controlled clock was invented in 1895. It is independent of a mains supply and is based upon a free pendulum system; variations in electric supply do not affect its time-keeping. The unrivalled time-keeping accuracy of this electrical-impulse clock is due to a special switch system, which always applies a constant force to the pendulum at the centre of its path. It cannot do otherwise, and for that reason this unique clock has been used for keeping Greenwich time since 1925, and has broken all world records for accurate time-keeping. The same system was used to originate the B.B.C. 'Six Dot' time-signals.

In a large building it is not necessary to instal more than one of these clocks. One main or master clock can control the time-keeping of any number of subsidiary clocks connected with it. Current supply can be taken from batteries or from the mains, but for an alternating current supply a rectifier must be introduced. Consumption is negligible; one B.O.T. unit will operate a circuit of twenty-five clocks for ten years. For large offices or works, or for public buildings, this type of foolproof time-control is without a competitor. The manufacturers are prepared to instal a general time-keeping system on a rental and service agreement.

Nor is time-recording the only service offered. Various operations set at predetermined and regular times can be operated automatically from the master clock. Electric bells, hooters, sirens, or any kind of mechanical signal may be faithfully controlled. Even church-bells may be rung at set times, recorded peals being sounded in place of actually-rung sounds; this latest innovation has been adopted by quite a number of war-damaged churches and churches whose manually-operated belfry would otherwise require costly replacement. In factories, employee-time recording systems and 'tell-tale' watchman's clock-control recorders can be installed in conjunction with the master system of electrical-impulse time-keeping. It is impossible in a short space to explain adequately all the practical possibilities this system of time measurement offers, but it is true to say that far too few people are aware that so much

accuracy and time-control has been available since 1895.

Incidentally, one such clock at the Paris Observatory ran for nearly two years without discoverable error—and in this sense error means something of the order of thousandths of a second in many months. Another clock installed at Greenwich in 1926 ran for nine years without stopping, and one at Warsaw installed in 1927 had not stopped at all up to the time the observatory was destroyed in the recent war.

AEROSOL FLY-SPRAYS FOR THE HOME

For some years the American housewife has been able to control insect nuisance, and especially fly nuisance, in the home with the combined aerosol sprayer and can of insecticide. What is known as an aerosol is a mist of very fine droplets which can persist for some time in the air. The aerosol method of pest-control is considerably employed by commercial glasshouse horticulturists and in warehouse sanitation. The low-pressure domestic aerosol container has only recently become available in this country; previously it has been manufactured solely in the United States, where over twenty million of the cans were sold last year alone. No separate spraying appliance is needed. The container in which the insecticide is bought is also the projector of the aerosol; pressing a button causes the emission of an extremely fine mist. From three to five seconds' operation is enough to provide full insect-control for a room of 1000 cubic feet, and short emissions directed at flying insects or near them will be sufficient to deal with individual invaders. The spray is composed of a harmless liquid, as the aerosol propellant, together with a concentrated insecticide. When the contents of the can have been exhausted, the container is not refilled; it is discarded, and another container obtained for further supplies. However, this is not wasteful, for the projection of the aerosol does not depend upon a complex or costly design of can so much as upon the physical properties of the propellant liquid, which is held in the can at low pressure until the button is pressed. Three sizes are at present available—small, for household use; medium, for industrial and municipal use; and large, for farm buildings, etc. The great success of this new method of insect-control in America in recent years indicates that it is likely to be similarly popular here.

AN IMPROVED OPEN-FIRE WATER-HEATER

One of the best-known manufacturers of boilers and radiators has recently introduced a new open-fire unit which will fit into any fireplace with a 16-inch grate-opening. This fire will run on coke, coal, or anthracite; it has a gas ignition-unit for easy lighting. A specially-designed high-efficiency boiler-unit is incorporated, and it is claimed that this will provide sufficient hot water for baths, for the usual domestic tap needs, and for feeding three radiators in other parts of the house.

Another new domestic-heating appliance introduced by this company is a hot-water radiator for background heating, which also carries either an electric- or gas-fire unit to be switched on when additional heating is needed. Both these appliances have been featured at recent exhibitions.

A PROCESS-TIMER

In many factories, particularly in those engaged in the production or cooking of food, certain operations have to be conducted for precise periods of time. A new type of clock should prove an effective introduction wherever such conditions are met. The clock does not tell the normal time, but has a 4-inch-diameter dial graduated clearly in sixty minute-divisions. It is set and automatically wound by placing an indicator hand at the required period of the process in minutes. When the revolving pointer has completed this number of minutes, a bell alarm is given. Possibly the only drawback to this appliance is the fact that it is limited in its application to processes which last for not more than one hour, this being the time-limit for one complete revolution of the pointer round the sixty-minute dial.

To CORRESPONDENTS who wish fuller information regarding new inventions, publications, etc. mentioned here, addresses will be furnished, when possible, if (and only if) a stamped addressed envelope or postcard for a reply be sent to the Editor, *Chambers's Journal*, 11 Thistle Street, Edinburgh. To avoid delays, requests of this kind from correspondents abroad will be forwarded to the manufacturer or agent if stamps, postal orders, or imperial or international reply coupons are enclosed for the purpose. The issue of the *Journal* and the heading of the paragraph in which the object of inquiry is described should be given in order to facilitate reference.

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